Service Systems for Benefits Realization

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Martin Semmann

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The following evaluators recommend the acceptance of this dissertation:

First evaluator: Prof. Dr. Tilo Böhmann

Second evaluator: Prof. Dr. Kathrin Möslein

Zusammenfassung

In den letzten Jahrzehnten stiegen Investitionen in Informationstechnologie deutlich. Für diese IT-Investitionen werden Teile des Budgets von Unternehmen gebunden, um Prozesse und generell die Leistungsfähigkeit von Unternehmen zu verbessern. Dennoch bleiben die Wirkungen und der Nutzen von IT-Investitionen hinter den Erwartungen zurück. Dieser Problemstellung wird mit der vorliegenden Arbeit begegnet.

Um organisationale Veränderungen durch IT zu verstetigen und deren Wirksamkeit zu steigern, wird in der vorliegenden Dissertation Gestaltungswissen für Dienstleistungssysteme zur Realisierung von Nutzenpotenzialen systematisch entwickelt. Dazu werden Erkenntnisse der Dienstleistungsforschung und Forschung zu IT-getriebener Veränderung von Organisationen integriert. Die Dienstleistungsforschung, als erstes Forschungsfeld, versteht dabei Wertschöpfung (engl. Value co-creation) als ein gemeinsames Unterfangen verschiedener Akteure, die innerhalb eines spezifischen Kontextes und durch Nutzung von Ressourcen miteinander abgestimmt auf ein Wertversprechen hin interagieren. Als zweites Forschungsfeld dieser Arbeit dient IT-getriebene organisationale Veränderung und insbesondere Technochange, um die Lücke zwischen IT-Investitionen und der Realisierung von Nutzen zu schließen. Dabei werden insbesondere die Erkenntnisse der zeitverzögernden Wirkung von IT Investitionen berücksichtigt, um bei dynamischen Rahmenbedingungen von Organisationen und ihrer Projekte sicherzustellen, dass angestrebte Nutzenpotentiale realisiert werden können.

Als Schnittstelle zwischen beiden Forschungsfeldern dient hierbei das Verständnis von Wert (engl. value) und der gemeinsamen Wertschöpfung aus der Dienstleistungsforschung sowie das Nutzenverständnis (engl. benefit) der Forschung zu IT-getriebener Organisationsveränderung. Beide Konzepte bilden dabei verschiedene Facetten der Wirksamkeit von Maßnahmen zur Beeinflussung von Organisationen ab. Dieses Bindeglied dient als Mediator zwischen beiden Forschungsfeldern.

Forschungsmethodisch wird dabei ein mehrphasiges, Multi-Methoden Vorgehen gewählt, um in zwei unterschiedlichen Domänen gestaltungsorientiertes Wissen zu erarbeiten. Die Domänen sind dabei (1) Weiterbildungsdiensleistungen, als Instrument der Stabilisierung organisationaler Veränderungen, und (2) Nutzenmanagement bei Software-bezogenen Dienstleistungen, insbesondere die Einführung und Veränderung von Unternehmenssoftware. Aus einer

Veränderungsperspektive zeichnet sich die Einführung und Modifikation von IT dadurch aus, dass Software dazu genutzt werden kann, Veränderungen zu initiieren und zu stabilisieren. Um dieses Potenzial zu heben, ist es notwendig Anwender frühzeitig einzubinden und Partizipationsmöglichkeiten zu schaffen. Innerhalb der ersten Phase dieser Dissertation werden in beiden Domänen strukturiert Chancen und Hemmnisse identifiziert. Dies geschieht aus zwei Perspektiven. Einer Dienstleistungssystem-Perspektive und einer Perspektive IT-gestützter organisationaler Veränderungen. Basierend auf dieser Analyse werden in der zweiten Phase Gestaltungsprinzipien abgeleitet, die im Rahmen von gestaltungsorientierten Forschungsprojekten zu Artefakten in Organisationen zunächst überführt, dann implementiert und schließlich evaluiert werden.

Im Rahmen dieser Dissertation werden verschiedene theoretische Beiträge geleistet. Hinsichtlich IT-getriebener organisationaler Veränderung konnte durch eine strukturierte Erhebung des Standes der Praxis analysiert werden, wie Organisationen Nutzenrealisierung in der Nachprojektphase umsetzen. Basierend auf diesen Erkenntnissen wurden Herausforderungen und Hemmnisse der Realisierung von Nutzenpotenzialen erarbeitet, um ein besseres Verständnis der Nachprojektphase zu erhalten. Dieses Wissen wird zu Konstruktionsprinzipien weiterentwickelt, die zum Verständnis und Gestaltungsmöglichkeiten von Nutzenmanagement und IT-gestützten Organisationsveränderungen beitragen. Zusätzlich wird Wissen über IT-getriebene Veränderungen von Organisationen, um Aspekte der Einbindung von Nutzern und ihren individuellen, kontextualisierten Erfahrungen und Praktiken, erweitert. Dadurch kann Veränderung verstetigt und intensiviert, aber auch Hemmnisse gezielt abgebaut werden. Durch die Gestaltung, Instanziierung und die Evaluation eines Artefakts werden evidenzbasierte Erkenntnisse über Akteurs-bezogene und Kollaborations-unterstützende Plattformen für Dienstleistungssysteme gewonnen. Daraus wurden wiederum Beiträge zur systematischen Gestaltung von Dienstleistungssystemen abgeleitet. Weiterhin trägt diese Dissertation durch die Analyse zweier Domänen von Dienstleistungen und der gezielten Verknüpfung des Nutzen- und Wertbegriffs dazu bei, Nutzen für Akteure zu realisieren. Dadurch kann mittelbar die Wertschöpfung von Organisationen positiv beeinflusst werden.

Aus der einer praxisorientierten Sicht leistet diese Dissertation ebenfalls verschiedene Beiträge. Im Bereich von Weiterbildungsdienstleistungen wird Gestaltungswissen abgeleitet, um IT-gestützte Weiterbildungsangebote zu realisieren, die einen organisationalen Wandel fördern.

Dabei wird aufgezeigt, wie durch Anwendungsorientierung solcher Dienstleistungen Veränderungsimpulse gezielt in die Arbeitsweisen von Mitarbeitern überführt werden können. Ebenfalls kann durch die strukturierte Erhebung des Standes der Praxis im Bereich Nutzenmanagement ein Beitrag geleistet werden, um Nutzenrealisierung als zentrales Ziel von IT-Investitionen zu fördern. Schließlich wird ein Beitrag zur Einbindung und Kollaboration von Akteuren basierend auf ihren kontextualisierten Kenntnissen und Anforderungen geleistet. Dies geschieht mit dem Fokus auf die Einführung neuer oder geänderter Unternehmenssoftware. Durch die Anwendung dieser Ergebnisse können Organisationen angestrebte Nutzenpotenziale realisieren, aber auch sich dynamisch ändernden Rahmenbedingungen begegnen.

Für zukünftige Forschungsarbeiten werden in drei zentralen Themenfeldern Implikationen aus dieser Dissertation abgeleitet. Zunächst bietet sich für die systematische Gestaltung von Dienstleistungssystemen weiterhin Forschungsbedarf hinsichtlich der Etablierung von Methoden zur Analyse, Ausgestaltung und Veränderung von Dienstleistungssystemen. Insbesondere durch die gezielte Verbindung von einer Dienstleistungsorientierung mit einer Systemperspektive ergeben sich Ansatzpunkte und offene Forschungsfragen. Weiterhin besteht Forschungsbedarf hinsichtlich der Einbindung und Befähigung von Akteuren zur Realisierung von Nutzenpotentialen innerhalb der Nutzungsphase. Trotz zahlreicher Vorgehensmodelle und Konzepte zum Nutzenmanagement ist die Verbreitung in der Praxis sehr begrenzt. Daher bietet sich großes Potenzial für nutzerzentrierte Ansätze. Das dritte Forschungsfeld, ist die systematische Einbeziehung und Partizipation von Nutzern an organisationaler Transformation. Insbesondere durch weitere Forschungsaktivitäten im Bereich des internen Crowdsourcings bietet sich das Potential Veränderungen und deren Entwicklungsrichtung besser zu systematisieren, verstehen und gestalten zu können. Zudem bieten sich in diesem Forschungsfeld im Zuge der digitalen Transformation zahlreiche Interventionspunkte und Bedarfe für rigorose Handlungsempfehlungen.

Stichworte: Service Systems Engineering, Technochange, Value in Context, Benefits Management, User- centered Service

Abstract

Throughout the last decades, information technology (IT) investments grew significantly. By investing portions of their budget, organizations seek to improve their processes, practices, and performance. Nevertheless, the resulting value of IT investments does not meet expectations. To bridge this gap, this dissertation focuses on IT investments that are implemented as IT projects and the usage phase of IT project solutions.

To sustain the organizational changes through IT and to increase their effectiveness, this dissertation proposes design knowledge for systematically develop service systems to realize benefits. For this purpose, service science is integrated with research on IT-driven organizational change. Service science, as the first field of research, defines co-creation as a joint undertaking of actors who interact within a specific context and using resources to realize a value proposition. The second field of research in this dissertation is IT-driven organizational change and especially technochange, to close the gap between IT investments and the realization of benefits. In particular, the findings of the time-delaying effect of IT investments are taken into account to ensure that the dynamic conditions of organizations and their IT projects ensure that desired potential benefits can be realized.

The interface between these two research fields is the understanding of value and the joint creation of value from service research as well as the understanding of the benefits of research on IT-driven organizational change. Both concepts represent different facets of the applicability and effectiveness of interventions to influence organizations. This link serves as a mediator between the two fields of research.

Regarding research methodology, a multi-phase, multi-method approach is chosen to develop design knowledge in two different domains. The domains are (1) corporate education services, as an instrument for the stabilization of organizational changes, and (2) benefit management for software-related services, in particular, the introduction and modification of business software. The introduction of IT is characterized by the fact that software can be used to initiate and stabilize changes from an organizational change perspective. To increase this potential, it is necessary to involve users at an early stage and create opportunities for participation. Within the first phase of this dissertation, opportunities and inhibitors are identified in both domains in a structured manner from two perspectives. A service system perspective and a perspective of

IT-driven organizational change. Based on this analysis, design principles are derived in the second phase. Applying these principles, artifacts are implemented, instantiated and evaluated within an organization as design science research projects.

By doing so, this dissertation contributes several aspects to research knowledge. Regarding IT-driven organizational change, a structured assessment of the state of practice has enabled us to analyze how organizations seek for realizing benefits in the post-project phase. Based on these findings, opportunities and inhibitors to the realization of anticipated benefits were derived to gain a better understanding of the post-project phase. This knowledge is further developed into design principles that contribute to the understanding and design possibilities of benefit management and IT-supported organizational change. Also, knowledge about IT-driven changes in organizations is expanded to include aspects of user involvement and their individual, contextualized experiences, and practices. Utilizing this knowledge supports to drive and to sustain organizational change, but also helps reducing barriers of affected users. The design, instantiation, and evaluation of an artifact provide evidence-based insights into actor-related and collaborative platforms for service systems. From this, contributions to the systematic design of service systems were derived. Also, by focusing on two distinct service sectors utilizing an integrated value and benefit perspective, this dissertation contributes to service science and IT-driven organizational change. This novel combination leads to improved understanding of benefits realization and thus affects organizational performance indirectly.

From a practice-oriented point of view, this dissertation also makes various contributions. In the area of corporate education services, design knowledge is derived from implementing IT-supported corporate education services that promote organizational change. Thus, implications are derived that support to relate organizational change to employees work practice and accordingly increase the transfer of training of corporate education services. Equally, a contribution is made to the field of benefits management. By analyzing the state of practice, insight on benefits realization and its relevance in organizations is gained. This knowledge helps practitioners to assess organizations approaches to realize benefits and further improve them. Finally, a contribution is made to the integration and collaboration of actors based on their contextualized knowledge and task-specific requirements. This is done with a focus on the introduction of new or modified business software. By applying these results, organizations can realize the desired benefit potential, but also counteract dynamically changing conditions.

Implications for future research are derived from this dissertation in three central thematic areas. First, as service systems engineering will continue to require further research on the establishment of methods for the analysis, design, and modification of service systems, this dissertation proposes several starting points for further research. In particular, the targeted combination of a service-dominant logic with a system perspective results in open research questions. Furthermore, there is a need for research on the integration and empowerment of actors to realize potential benefits within the usage phase of software solutions. Despite numerous procedural models and concepts for benefit management, the prevalence in practice is limited. Therefore, great potential for user-centered approaches exist. As the third field of research that deserves further attention, the systematic involvement and participation of users in organizational transformation has several open research questions. Especially through further research activities in the area of internal crowdsourcing, the potential to systematize, understand and shape changes and their direction of development is offered. Also, numerous intervention points and requirements for rigorous recommendations for action are provided in this field of research in the course of digital transformation.

Keywords: Service Systems Engineering, Technochange, Value in Context, Benefits Management, User-centered Service

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List of Abbreviations

BM	Benefits Management
CES	Corporate Education Service
DSRM	Design Science Research Model
GDL	Goods-Dominant Logic
IS	Information Systems
IT	Information Technology
LMS	Learn Management System
RQ	Research Question
SDL	Service-Dominant Logic
SSE	Service Systems Engineering

1 Introduction

1.1 Motivation

The core research theme of the thesis is designing and improving service systems for benefits realization. Thus, this research contributes to improving organizational practice through information technology (IT) with an underlying service systems perspective. By that point of view, a significant economic lever is addressed as the service sector comprises 74.3% of employees in 2016 in Germany (German Federal Statistical Office 2017a) and IT investments globally still rise and were estimated in 2012 at $4.5 trillion USD (WITSA 2010). Accordingly, empirical studies show that benefits of these IT investments are only realized insufficiently (Bradley 2010; 1e Limited 2015). This research addresses this situation while benefiting from two distinct, but complementary conceptual foundations that both seek to realize benefits from different perspectives.

The first conceptual foundation is service systems engineering (SSE). Service systems are socio-technical systems focused on value co-creation (Böhmann et al. 2014; Peters et al. 2016). The notion of value co-creation emphasizes a process in which different actors integrate resources for mutual benefit (Maglio et al. 2009; Spohrer and Maglio 2010). Value is considered contextual and thus contingent on the beneficiary (Ng and Smith 2012; Vargo and Lusch 2004). Fundamentally, service views value as being created not in production but in use (Edvardsson et al. 2011; Grönroos 2009; Möslein and Kölling 2007), i.e., when what is delivered is used to achieve an effect. Some researchers have pointed out that a service provider can only facilitate the creation of value by the recipient of the service (Grönroos 2009). To give an example, value is not the car itself but the mobility it delivers. An actor providing the car thus only facilitates value creation through the user of the car. Moreover, value consequently depends on the context within which it is created (Alter 2011; Edvardsson et al. 2011; Grönroos and Gummerus 2014; Lusch et al. 2010; Ng and Smith 2012). Service systems orchestrate operant and operand resources that enable such a process of value co-creation and thus affect value in use for beneficiaries (Alter 2012; Böhmann et al. 2014; Chandler and Lusch 2015; Maglio et al. 2009; Zolnowski and Warg 2018). In this context, SSE seeks to generate evidence-based design knowledge for such service systems (Böhmann et al. 2014; Vargo and Lusch 2016b).

The second conceptual foundation is that of benefits realization and benefits management (BM) in IT. Here, the emphasis is on how organizations succeed in putting information systems (IS) to use and thus generating value through beneficial performance improvements enabled by these IS (Markus 2004; Markus and Benjamin 1997; Ward et al. 1996; Zmud and Cox 1979). Research on BM gained importance within the last decades and led to various approaches that aim to improve benefits realization (Ahlemann et al. 2013; Ashurst 2015; Balta et al. 2015; Bradley 2010; Doherty et al. 2012; Serra and Kunc 2015; Ward and Daniel 2013). These approaches focus on efficiently managing benefits within IS projects to ensure the realization of benefits, leading to value creation. Nevertheless, the application of these diverse approaches in organizations falls apart (Semmann and Böhmann 2015; Ward et al. 2007), leading to unrealized benefits (Bradley 2010; 1e Limited 2015). Especially, regarding emergent challenges like the digital transformation of organizations, the actual realization of benefits is crucial to complement these changes (Brynjolfsson and Hitt 2000; Gregor et al. 2006; Majchrzak et al. 2016; Markus and Benjamin 1997; Matt et al. 2015; Orlikowski 1996; Venkatraman 1994).

These two perspectives are complementary. Common to these perspectives is the focus on value created in a complex, multi-actor process of co-creation. Benefits realization and BM almost appear to be informed by service logic, although research on benefits realization emerged independently of service logic. However, benefits realization and management frame the challenge of how actors implementing IS can facilitate generating value if the value is dependent on the use of the systems by another set of actors. Moreover, BM proposes methods and tools that support the generation of value in such settings of value co-creation.

Thus, while each perspective can be employed individually, they both point to a common core of the co-creation of value in complex socio-technical settings and can be leveraged for a better understanding of inhibitors of value co-creation as well as for supporting the design of service systems for benefits realization. This complementary approach is realized within the two domains corporate education services and benefits management for software services (cf. Figure 1).

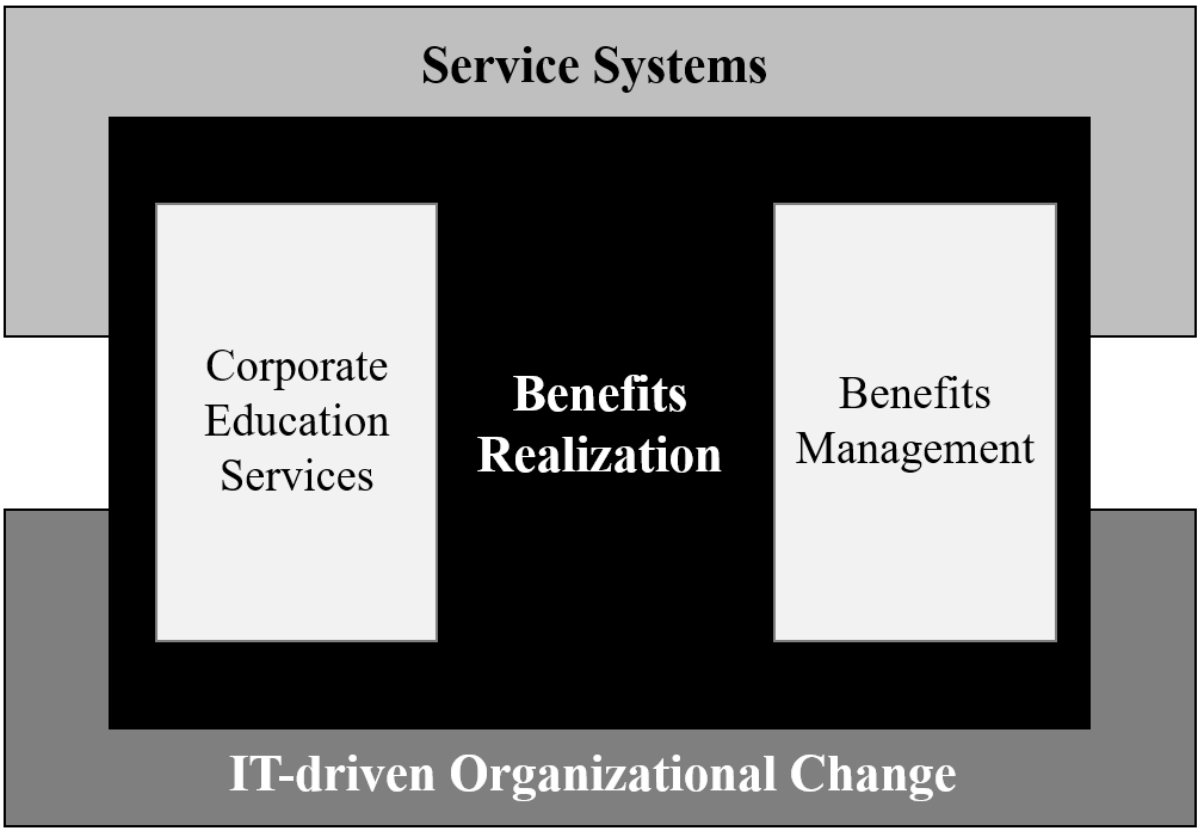

Figure 1. Related areas of research of this thesis

Source: Own representation

As organizational change requires changing the behavior of employees, corporate education services (CES) is the subject of this thesis, as CES facilitate change (Benjamin and Levinson 1993; Huczynski 1983; Jacobs 2002; Kirkpatrick 1996; Zmud and Cox 1979). BM with a focus on software services is the second domain of research within this thesis. As new business opportunities resulting from advances in IT from a service systems perspective or general IT-driven organizational change, aimed at beneficial adaptation or evolution of business, the realization of these beneficial effects is crucial. Thus, BM explicitly addresses the realization of benefits that arise from the use of IT (Ward et al. 1996).

1.2 Research Goals and Research Questions

Research in this thesis can be subsumed under the broad theme of SSE and IT-driven organizational change. Both concepts are applied as macro-perspectives that are strongly reciprocally related to each other. To drill down to more operational learnings, BM is applied as a micro-perspective on this broader theme. Thus, the main contribution relates to the realization of benefits during the shakedown and benefit capture phase of technochange by applying SSE

methods. This is done by analyzing and establishing service systems. Hereby, IT-based service systems are focused as technology bears the potential to develop organizations further and persist in this change. This duality is represented in the technochange framework that provides the second perspective of this thesis. By applying this framework as a mental model to study service systems, this thesis contributes to the body of knowledge of IT-driven organizational change, particularly the realization of benefits. Additionally, by applying the design science research model (DSRM) in the context of SSE, evidence-based insight is derived that broadens the scholarly perspective on the prerequisite of organizational engagement in scholarly endeavors. Accordingly, the overall aim of this research is:

Designing service systems for benefits realization.

As scholars call for cumulative research in service science (Böhmann et al. 2014) as well as design research (Gregor and Jones 2007; Iivari 2015; Niederman and March 2012), this thesis responds to these calls by including several research efforts and deriving results as a contribution to the body of knowledge in the mentioned disciplines. This cumulative effort is mirrored in table 1, based on the research questions that led to each article.

Table 1. Research questions within the overall theme answered within the thesis

	Benefits Realization	
	Opportunities & Inhibitors (Phase 1)	**Designing Service Systems for Benefits Realization (Phase 2)**
Corporate Education Services	• What are possibilities for productivity improvement in highly co-created corporate education services according to the business model lens? (Zolnowski et al. 2012) • How does adopting a business model lens facilitate the search for productivity improvements (Zolnowski et al. 2012) • What is the influence of learning management systems on service productivity? (Semmann et al. 2012)	
Benefits Management	• Thus, we seek to investigate activities related to benefits management prior to, and during the project as a precursor of understanding post-project benefits management. (Semmann and Böhmann 2015)	•What are design principles for post-project benefits management to strengthen the materialization of value in context? (Semmann and Böhmann 2018) • How can a concept to empower users for co-creation of change initiatives be designed to enhance the possibilities to realize benefits? (Semmann and Grotherr 2017)

Source: Own representation

To achieve this overall goal, several research steps are taken in two distinct naturalistic environments. Initially, the state of practice is assessed for CESs (Zolnowski et al. 2012). This domain specifically relates to the shakedown phase of the technochange lifecycle, as it comprises learn efforts of employees or users related to IT-driven organizational change projects. Additionally, the focus of analysis is to identify opportunities and inhibitors that affect service systems. By doing so, knowledge on the utility of a business model perspective as part of the methodological set within SSE is obtained. To further elaborate on CESs as a facet of shakedown, the requirements for learning management systems (LMSs) are analyzed regarding their potential to support organizational change with IT (Semmann et al. 2012). Both papers can be included as the first phase of this dissertation project.

The second phase of this dissertation project mirrors the approach with a focus on the benefits capture phase of the technochange lifecycle. As this aspect of IT-driven organizational change is only scarcely tackled by scholars, this phase deepens the analysis and results in an instantiation of a service system. Initially, the state of practice is assessed for the benefits capture phase within technochange projects (Semmann and Böhmann 2015). This analysis builds the foundation for further activities, as it provides deep insight on how service systems are materialized in practice and the role of value in context as a conceptual lever for organizational change. Thus, the findings motivate further research on this facet of service systems. Based on these findings, requirements for activities for benefits realization after formal closure of technochange projects are derived to leverage the potential of value in context within the actual context (Semmann and Böhmann 2018).

The derived requirements for effecting organizational change by fostering value in context were then utilized to develop design principles to guide the initiation of service systems (Semmann and Böhmann 2018). Influenced by these principles[1], a service system is instantiated in a naturalistic setting to enable users to initiate changes (Semmann and Grotherr 2017). The utilization of DSRM helps to deliver an appropriate solution for a shortcoming of current practice.

[1] As the paper could not be published timely, the principles could only influence the resulting service system as described in the paper (Semmann and Grotherr 2017). Accordingly, within the paper no references regarding the design principles could be made.

Thus, this research contributes to advance the body of knowledge on IT-driven organizational change and SSE.

As these research questions guide this thesis, the remainder of the thesis is structured accordingly. The structure is described in detail in the following section.

1.3 Outline of the Thesis

As this thesis uses a multiphase multi-method research strategy, the outline of the thesis is structured accordingly (cf. Table 2). Following this introductory section, the overall research approach with the embodied strategy and applied methods is described. In the third chapter, the theoretical foundations on which this thesis builds are presented. The fourth chapter describes the publications included and constituent for this cumulative thesis. Additionally, all related publications are listed. Chapter 5 summarizes and unites the research contribution of the cumulative research. The sixth chapter summarizes and unites the practical contribution of this thesis, followed by the limitations in the seventh chapter. Based on the findings of this thesis, Chapter 8 presents implications for further research endeavors. Lastly, Chapters 9 to 12 and Appendix A comprise the papers that constitute the main contribution of this thesis. While cumulative dissertations generally build on publications in scientific conference proceedings and journals, an additional paper that is currently under review is included as an appendix to this dissertation.

Table 2. Structure of this thesis

Wrapper	**1. Introduction**	**2. Research Design**	**3. Theoretical Foundations**	**4. Publications**
	5. Research Contribution	**6. Practical Contribution**	**7. Limitations**	**8. Implications for Further Research**
Publications	9. Publication	Identifying Opportunities for Service Productivity Improvement Using a Business Model Lens – Lessons from Corporate Education Services		
	10. Publication	Analysis of Learning Management Systems According to a Holistic View on Corporate Education Services		
	11. Publication	Post-Project Benefits Management in Large Organizations – Insights of a Qualitative Study.		
	12. Publication	How to Empower Users for Co-Creation – Conceptualizing an Engagement Platform for Benefits Realization		
	A: Publication	Deconstruction of Post-Project Benefits Management Practice – Deriving Design Principles to Foster Contextual Benefits Realization		

Source: Own representation

2 Research Approach

This doctoral thesis builds on the research streams of service science and IT-driven organizational change with the aim to gain insight into delivering value with IT. This is done in two distinct domains – CESs and BM with a focus on software services – by analyzing service systems and their effect on IT-driven organizational change and by establishing a service system that frames organizational change within the group of users focused on software solutions. Thus, evidence-based insight is derived that fills the research gaps within the overlap of the mentioned research streams. The following chapter motivates this research and states a detailed problem statement for the overarching research theme and the research questions addressed in the publications that build the frame of this thesis.

2.1 Research Strategy

This thesis applies a multi-method research strategy to answer the research questions (cf. Table 1) and thus, contribute to the body of knowledge on IT-driven organizational change in service systems. Accordingly, the research strategy employs qualitative data from diverse sources that are related to service systems for benefits realization. Thus, the research strategy differs from mixed-method approaches that utilize qualitative and quantitative data on a single subject (Creswell and Clark 2007; Hesse-Biber 2010), whereas multi-method research refers:

> "To the mixing of methods by combining two or more qualitative methods in a single research study (such as in-depth interviewing and participant observation) or by using two or more quantitative methods (such as a survey and experiment) in a single research study" (Hesse-Biber 2010, p. 3).

However, this research strategy is not limited to single research studies, as it bears the potential to be carried out in closely connected studies or encompassing programs as well (Hanson et al. 2005; Yadav et al. 2016).

Employing a multiphase, multi-method research strategy is considered a valid method to avoid methodologically induced biases (Jarvenpaa 1988). Consequently, this strategy is deemed powerful to derive insight in complex socio-technical systems and overcome shortcomings of studies conducted by applying a single research method (Brewer and Hunter 2006; Papas et al. 2012).

To apply the research strategy the epistemological foundations have to be explicated (Niehaves 2007; Porra et al. 2014). For this thesis, pragmatism is adopted as the epistemological foundation (Bertelsen 2000; Cole et al. 2005; Hevner et al. 2004; March and Smith 1995). Pragmatism aims for actions and change that shape a dynamic state of a social environment (Goldkuhl 2012). This focal role of actions that trigger and incorporate change is predominant for multi-method research, with the strong emphasis on practical application (Jokonya 2016; Sein et al. 2007). Accordingly, the utility of concepts and interventions is assessed according to its consequences in practice (Peirce 1878).

For this thesis, a multiphase multi-method design is applied (cf. Figure 2). This method is applied to examine IT-based service systems iteratively in two real-world settings. The first phase focuses on understanding opportunities and inhibitors for benefits realization in two distinct contexts. This phase results in design variables that affect service systems in CESs and BM. The second phase builds on these results and domain-specific knowledge by applying DSRM to create artifacts for benefit realizing service systems. Finally, the results are summarized, and a general contribution is derived from the third phase. This thesis represents this last phase.

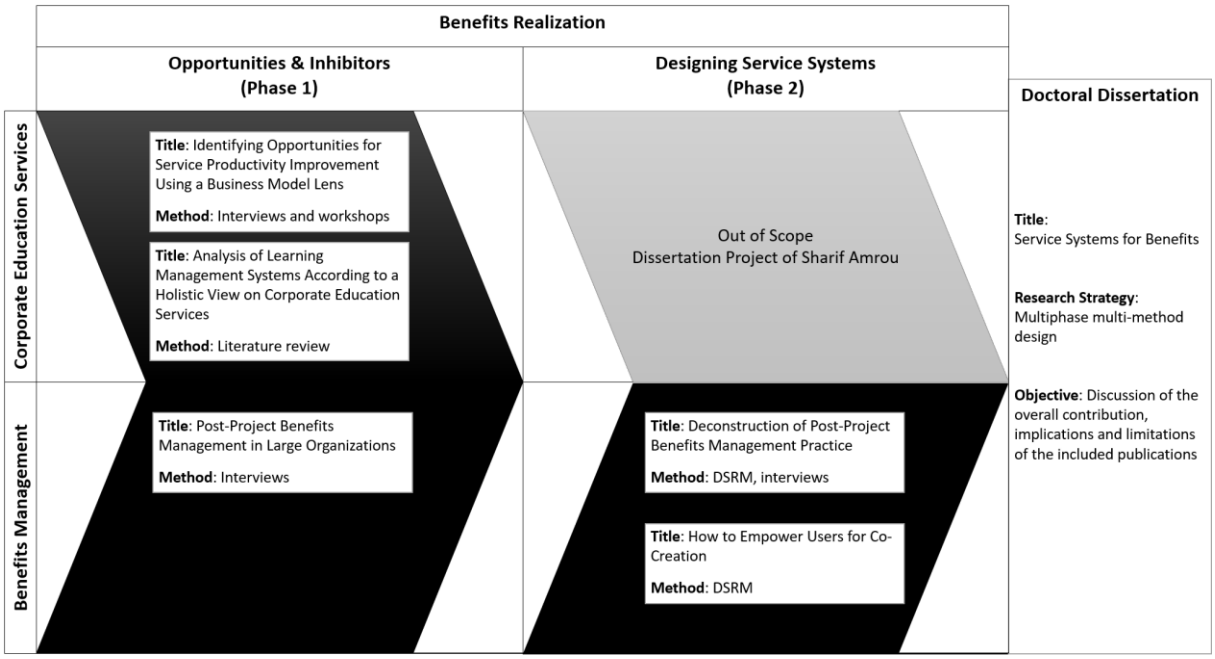

Figure 2. Phases of the applied multiphase multi-method design

Source: Own representation

2.2 Research Methods

2.2.1 Design Science Research Methodology

In IS research, two research paradigms are prevalent (Bichler et al. 2016; March and Smith 1995). Natural science research methods are applied to investigate behavioral aspects of human and organizational actions. Second, design science represents a solution-oriented paradigm that is grounded in engineering and the sciences of the artificial (Gregor 2006; Hevner et al. 2004). Design science research thus aims at creating innovative new artifacts to improve organizational practice while deriving theoretical insights (Alter 2015; Baskerville et al. 2015; Hevner et al. 2004; Papas et al. 2012; Simon 1996).

To realize design science projects, the DSRM is proposed to guide such construction-oriented research projects (Peffers et al. 2007). The general process consists of six phases in a nominal sequence and can be traversed iteratively (cf. Figure 3). Within the first phase *(1) Identify Problem and Motivate* the problem is defined and understood. Based on this understanding, the importance of the problem can be described by the potential value that a possible solution delivers. This is also needed to engage the audience of the research and gain commitment for the goals of the research project. The second phase *(2) Define Objectives of a Solution* aims for inferring objectives based on the defined problem and the state of the art in the field of investigation. Based on these objectives, an artifact is created within the third phase *(3) Design and Development.* Possible artifacts encompass "[…] constructs […], models […], methods […], and instantiations […]" (Hevner et al. 2004, p. 77) or "[…] new properties of technical, social and/or informational resources or their combination" (Järvinen 2007, p. 49). The activities within this phase encompass the definition of functionality, the architecture of the artifact and possible interfaces, and the design itself. After this phase, the fourth phase *(4) Demonstration* tests the artifact regarding its efficacy to resolve the defined problem. Based on this proof of concept, a more thorough assessment of the artifact and its utility and warranty is done within the fifth phase *(5) Evaluation.* This phase is crucial to design science research, as it observes and measures the problem-solving capability of a solution (Eekels and Roozenburg 1991; Hevner et al. 2004; Kuechler and Vaishnavi 2008; Nunamaker et al. 1990; Venable et al. 2016). This encompasses a comparison of the actual solution and the predefined objectives. The result could lead to another iteration within the DSRM to improve the solution or continue to the last phase *(6) Communication.* This final phase of the nominal process seeks to reflect on the project and

communicate within scholarly research publications. Thus, it ensures rigorous validation within the research community and enables a contribution to the disciplinary body of knowledge.

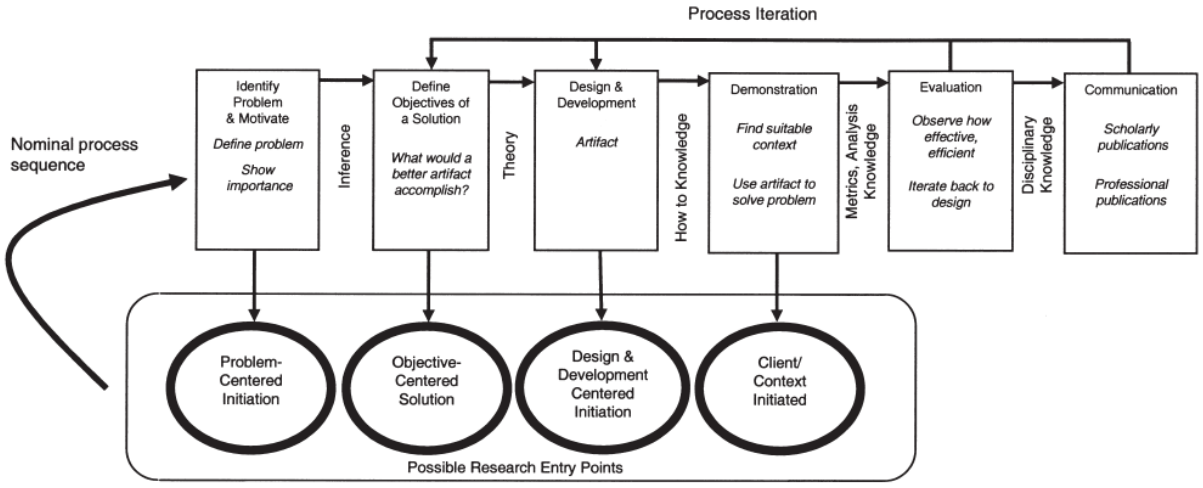

Figure 3. Design science research methodology (Peffers et al. 2007).

By applying DSRM, the guidelines for design science research proposed by Hevner et al. (2004) can be fulfilled. Due to the close binding of the solution with the objectives, iterative cycles, demonstration, and evaluation, a *viable artifact* can be designed (Hevner et al. 2004). Accordingly, as the objectives of the solution are derived by a distinct problem definition, and in this thesis, with close collaboration with practitioners, the addressed problems can be deemed *relevant*. The sixth phase of DSRM, *design evaluation*, is a key phase and needs to be rigorously done to assess the utility, quality, and efficacy of an artifact within an organizational context. By evaluating in a real-world setting, a *research contribution* can be validated in a context and thus extend the outcome of a design science project. Such outcome can be an innovative design artifact, a contribution to the body of knowledge on the design of an artifact or knowledge on the evaluation. To achieve this outcome, good design science projects need to apply *research methods rigorously* to design and evaluate artifacts by simultaneously being relevant. Given the iterative nature of DSRM, the characteristic of *design as a search process* is structurally incorporated and thus enables researchers to improve solutions and respond to organizational needs within DSRM incrementally. Finally, the last phase of DSRM is well aligned with the need to *communicate the research* as proposed by Hevner et al. (2004).

By applying DSRM and thus following the guidelines by Hevner et al. (2004), this thesis includes findings of two rigorously conducted design science projects that address the realization of benefits of corporate education and software introduction.

2.2.2 Literature review

Within this thesis, literature reviews are conducted to build the foundation of the research project and its domains (Baker 2000; Hart 1998). Thus, these reviews of literature build the starting point of the research projects with the aim to identify relevant sources and summarize the body of knowledge on which further research is based (Rowley and Slack 2004; vom Brocke et al. 2009). This phase is also referred to as "understanding the past to prepare for the future" by Webster and Watson (2002, p. xiii). Within this thesis, literature reviews were applied based on digital databases with partially broad or narrow scope of scientific outlets (i.e. the senior scholars' basket of the Association of Information Systems, the ranking of the German Academic Association for Business Research, and the German Informatics Society (Heinzel et al. 2008; Scholars 2011; Schrader and Hennig-Thurau 2009)).

2.2.3 Interview

As a core data collection method in qualitative research, interviews are applied within this thesis in several publications (Denzin and Lincoln 2011; Eisenhardt and Graebner 2007; Myers 2013; Myers and Newman 2007; Rubin and Rubin 2011; Sarker et al. 2013). Depending on their aim, interviews are differentiated in three categories: structured interviews, semi-structured interviews, and unstructured interviews (Esser et al. 2013; Myers 2013). Additionally, interviews can be distinguished based on the number of interviewees in an interview – a single interviewee or a group of interviewees (Myers 2013). For this thesis, the conducted interviews were semi-structured to explore the domains and organizational circumstances systematically. Thus, guidelines for the interviews were designed to structure the interviews loosely and to ensure an encompassing view on the topics under investigation (Stigler and Felbinger 2005). The interviewees were all experts in their domain. Accordingly, expert interviews were conducted (Gläser and Laudel 2010; Liebold and Trinczek 2009).

3 Theoretical Foundations

The contribution of this thesis is developed by building on several disciplines. The main influence is originated in service science. Within this research stream, three main aspects are considered that lead to the contribution. These are the concept of co-creation of value (Edvardsson et al. 2011; Grönroos 2008; Lusch and Vargo 2006a; Maglio and Spohrer 2008; Prahalad and Ramaswamy 2004; Vargo et al. 2008), value in context, value in use (Edvardsson et al. 2011; Lusch et al. 2010; Ng and Smith 2012; Peters et al. 2014; Vargo 2008; Vargo et al. 2008), and SSE (Aal et al. 2016; Beverungen et al. 2017; Böhmann et al. 2014; Chandler and Lusch 2015; Lusch et al. 2016; Spohrer et al. 2007; Storbacka et al. 2016). This body of knowledge builds the theoretical perspective of this research. Research on IT-driven organizational change complements this perspective by providing a general understanding of organizational change (Benjamin and Levinson 1993; Gefen et al. 2015; Markus and Benjamin 1997), the delaying effect of IT-driven change (Brynjolfsson and Hitt 1998; Marchand et al. 2000; Markus and Tanis 2000; Orlikowski 1996), and technochange as a framework (Markus 2004). Within both research phases of this thesis, two domains were utilized to derive contributions based on the overarching theoretical foundations. These domains are CES (Burke and Baldwin 1999; Castro-Martinez et al. 2008; Holton III and Baldwin 2003; Huczynski 1983; Kirckpatrick 1998; Montesino 2002; Velada et al. 2009) and BM (Ahlemann et al. 2013; Ashurst 2011; Bradley 2010; Breese et al. 2015; Jenner 2012; Mohan et al. 2011; Peppard 2016; Ward and Daniel 2013; Ward and Daniel 2006). The following subsections build the theoretical foundations within these disciplines and domains.

3.1 Service Logic, Service Systems, and Service Systems Engineering

Service is the main driver of prosperity and economic growth globally. Growth in the service sector thus ensures labor in developed countries as well as in emerging countries (International Labour Organization 2016). It is predicted that, until 2020, the number of workplaces will grow by 30%. This growth is mainly driven by the service sector, as 83% of these created jobs are included in this sector (International Labour Organization 2016). This development is depicted in figure 4.

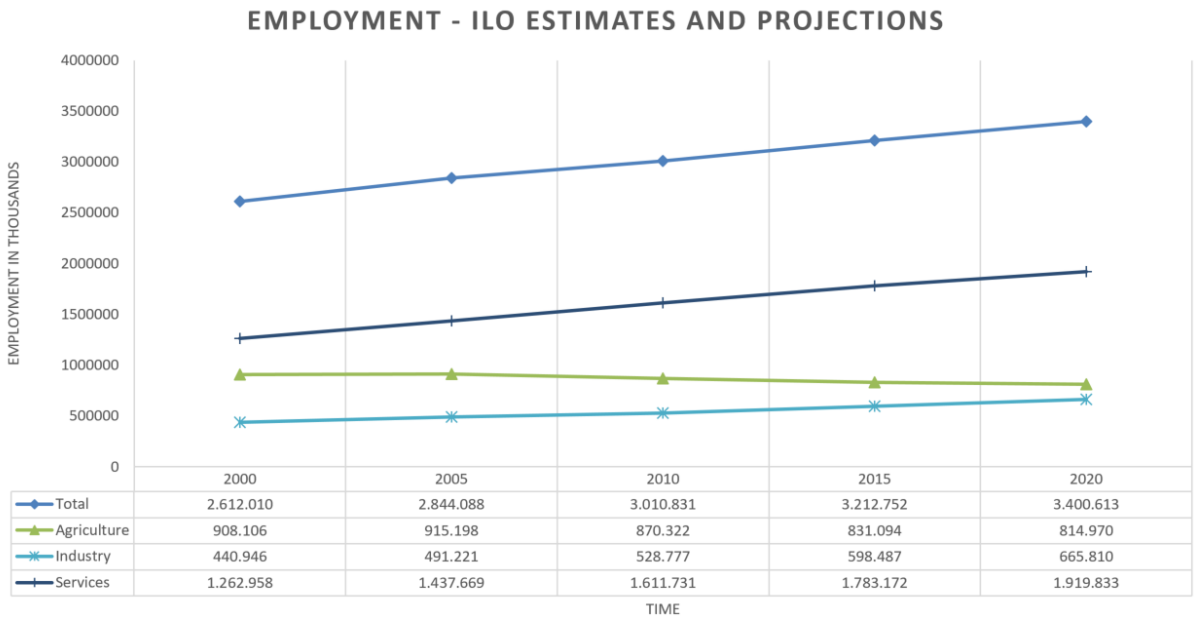

Figure 4. Development of employment from 2000 till 2020 by sectors

Source: Own representation of data by (International LabourOrganization 2016)

Accordingly, research on service has immense potential for increasing prosperity and sustain economies globally. Despite this economics perspective, this relevance of service is also mirrored in IS research (Barile et al. 2016; Böhmann et al. 2014; Chandler and Lusch 2015; Fielt et al. 2013; Leimeister 2012; Maglio et al. 2006; Peters et al. 2016; Rai and Sambamurthy 2006; Satzger et al. 2010). This importance to IS can also be observed by several sub-domains that apply different understandings of the term "service". On one hand, more technological meanings are applied (Ayed et al. 2011; Buhl et al. 2008; Channabasavaiah et al. 2003; Zhang et al. 2007) and on the other hand, an economic perspective is applied (Grönroos 2009; Maglio et al. 2009; Ng and Smith 2012; Spohrer and Maglio 2010; Vargo and Lusch 2004). Within this thesis, service is understood as a type of exchange that is delivered by a process that integrates resources and actors for the benefit of another party (Spohrer and Maglio 2010).

This rise of service is complemented by novel approaches to develop and manage business, its offerings and the view of customers (Chesbrough and Spohrer 2006; Grönroos 2008; Vargo and Lusch 2004). This service logic changes theory and practice, as central concepts emphasize collaboration and contextualization. Collaboration is thus understood as engaging actors to co-create value jointly (Edvardsson et al. 2011; Grönroos 2009; Möslein and Kölling 2007). This

is mirrored within service-dominant logic (SDL), which proposes a guiding framework for service research that is widely accepted and applied (Pohlmann and Kaartemo 2017; Vargo and Lusch 2016b).

In addition, SDL proposes a novel, service-driven perspective on economic exchange (Vargo and Lusch 2004) and thus, is reflecting the increased exchange of skills, knowledge, and intangibles as well as a shift from solely outputs to processes (Vargo and Lusch 2004; Vargo and Lusch 2015). Accordingly, SDL focuses on value and its co-creation by actors. To further elaborate SDL, Vargo and Lusch proposed eight foundational premises within the first approach for SDL (Vargo and Lusch 2004). Based on this new perspective on exchange, scholarly discourse lead to various improvements, refinements, extensions, and sharpening of the focus (Lusch and Vargo 2006b; Lusch and Vargo 2006c; Lusch and Vargo 2011; Lusch et al. 2008; Vargo and Lusch 2008c; Vargo and Lusch 2015; Vargo and Lusch 2016a; Vargo and Lusch 2016b). Thus, this refinement leads to five axioms that constitute this novel perspective on exchange. An overview of the axioms is given in table 3, and each of them is further described subsequently.

Table 3. Axioms of service-dominant logic (Vargo and Lusch 2015).

Axiom	**Description**
Axiom 1 / Foundational Premise 1	Service is the fundamental basis of exchange
Axiom 2 / Foundational Premise 6	Value is co-created by multiple actors, always including the beneficiary
Axiom 3 / Foundational Premise 9	All social and economic actors are resource integrators
Axiom 4 / Foundational Premise 10	Value is always uniquely and phenomenologically determined by the beneficiary
Axiom 5 / Foundational Premise 11	Value co-creation is coordinated through actor-generated institutions and institutional arrangements

Source: Own representation

The first axiom proposes that '*service is the fundamental basis of exchange*' and thus, represents the growing relevance of skills, services, and intangibles as the object of exchange (Vargo and Lusch 2004). This consequently subsumes goods as well, as this axiom relates to service as the process of value creation (Vargo and Lusch 2008b). The second axiom adds to this processual perspective, as it defines value creation as a joint undertaking by '*multiple actors, always including the beneficiary*' (Vargo and Lusch 2015). This co-creation does not imply consistent dyadic engagement of all actors in the process, as implied by Grönroos and Voima (2013), but by integrating resources of multiple actors. Consequently, leading to the third axiom that delineates that '*all social and economic actors are resource integrators'* (Vargo and Lusch 2015).

This axiom was not part of the initial foundational premises but was added in a first revision (Vargo and Lusch 2006) and further revised in the mentioned form (Vargo and Lusch 2008b). By proposing that *'value is always uniquely and phenomenologically determined by the beneficiary'* as the fourth axiom, SDL emphasizes the close relation of actors within co-creation and that the perception and thus circumstances of value depends on the beneficiary at a given time (Vargo and Lusch 2008b). The fifths axiom thus broadens the view toward an ecosystem perspective as it proposes that '*value co-creation is coordinated through actor-generated institutions and institutional arrangements*' (Vargo and Lusch 2015). Thus, strengthening the dependency of social and institutional contexts that further shape the creation of value.

Deriving from these axioms, this thesis focuses largely on the aspect of context as the main determinant of value co-creation. Despite the notion of value in use as representation for the shift from transactional to relational logic (Lusch and Vargo 2006c; Vargo and Lusch 2004; Vargo and Lusch 2006; Vargo and Lusch 2008b), SDL further developed toward a stronger focus on situational influence on value (Chandler and Vargo 2011; Vargo and Lusch 2016b). Thus, value is always co-created but is also based on the integration of resources that are contextually specific (Vargo et al. 2010). Chandler and Vargo (2011) established a broader understanding of value in context as the actual context strongly influences the realized value. Consequently, the assumption that operant and operand resources can be utilized in diverse contexts without affecting value creation and thus its output needs to be falsified. Thus, this understanding builds on the notion of resources that are "not static but expand and contract in response to human action" (Zimmermann 1951, p. 15). Accordingly, distinct actors realize different value by utilizing resources, as resources are not uniquely owned or controlled (Ford et al. 2011). Even more, an actor's application of resources depends on the context of the actor during the application, as actors' contexts are solely partially self-defined (Chandler and Vargo 2011). The relationship of actors and contexts is reciprocally shaped, as actors can partially define the context they are in and vice versa, the context partially shapes the actors (Giddens 1979). Therefore, value and its creation depend on situational as well as actor-related and comparative features (Sánchez-Fernández and Iniesta-Bonillo 2007). This is especially relevant in SDL, as resources are always integrated to create value for the beneficiary jointly. As Vargo et al. stated "value creation is an interactive process, and thus, value is created in a relational context" (2010, p. 134). Doing so implies that at least two distinct actors jointly co-create value and thus integrate resources within their contexts (Sampson 2012; Tuunanen and Cassab 2011).

Accordingly, the value created depends on the context. Therefore, the concept of value in context is crucial for understanding service, and SDL (Vargo and Lusch 2014) and reflects the dependency of value to a specific context (Alter 2011; Edvardsson et al. 2011; Grönroos and Gummerus 2014; Lusch et al. 2010; Ng and Smith 2012; Peters et al. 2016).

Building in this understanding of service, research expanded its perspective toward service systems to elaborate the integration of actors and resources further to realize value in context jointly (Alter 2012; Böhmann et al. 2014; Chandler and Lusch 2015; Maglio et al. 2009; Vargo and Lusch 2015). Accordingly, service systems are defined as "complex socio-technical systems that enable value co-creation" (Böhmann et al. 2014, p. 73). Such service systems represent an analytical framework to investigate joint value creation (Maglio and Breidbach 2014; Vargo and Lusch 2008a). Specifically, service systems orchestrate technology, actors, organizations, and resources to create mutual benefit (Kleinschmidt et al. 2017; Maglio et al. 2015). Building on this service systems perspective, connections between and complementarity of elements within service systems to co-create value can be addressed (Alter 2012; Voss and Hsuan 2009). Additionally, changes of the elements can be reflected over time and instantiations of service systems (Achrol and Kotler 2012).

To be able to not only analyze but also design service systems, SSE is an approach to systematically design and develop service systems (Böhmann et al. 2014). This approach builds on service engineering as a construction-oriented research stream that seeks to design and develop services (Bullinger and Scheer 2006; Leimeister 2012). Within service engineering, various models, methods, and design principles are proposed to systematically design services (Bullinger and Scheer 2006; Leimeister 2012). Despite solely focusing on single services, service engineering lacks the application of a service-dominant mindset (Ostrom et al. 2010) and does not utilize interactions and collaboration to the extent possible by building on state-of-the-art IS (Spohrer and Kwan 2009). Accordingly, it is necessary to evolve service engineering further as done in SSE (Böhmann et al. 2014). A challenge in this regard is the lack of evidence-based design knowledge on service systems (Satzger et al. 2010). Especially, three facets are needed to be better understood. Engineering of s*ervice architectures* that represent the interaction and dependencies between functional components, engineering of *service systems interaction* regarding context and collaboration of actors (Kieliszewski et al. 2012), and engineering *mobilization of resources* within service systems (Böhmann et al. 2014).

3.2 IT-Enabled Organizational Change

From early on IS researchers have been aware of social effects that occur as IT is introduced or changed (Zmud and Cox 1979). Nevertheless, little evidence was found regarding positive effects of IT investment and use on the value of organizations (Kauffman and Weill 1989). This is often seen as a lack of strategic alignment (Henderson and Venkatraman 1993) and lack of organizational change that accompanies IT investments (Markus and Robey 1988). To overcome this shortcoming, Markus established the concept of technochange that focuses on "[…] using IT strategically to drive *organizational* performance improvements […]" (2004, p. 4, emphasis in original). While projects are a critical phase in the technochange framework, this view is extended to those activities before and after the projects that are essential for effecting organizational improvements namely the chartering phase prior to the project and the post-project phases of shakedown and benefits capture (Markus 2004). In doing so, technochange emphasizes the shortcomings of a project being understood as solely an IT project or an organizational development project. Technochange projects, by contrast, inextricably link technology and organizational change (Markus 2004). Unsurprisingly, most projects can be considered technochange projects because, on one hand, typical IT projects like the implementation of software require organizational changes regarding workflows and training for employees. In contrast, business projects require changes in corporate IT. Due to this character of technochange projects, they embody a considerable risk of misalignment because the IT part of the project is often seen as given and therefore, does not fit the organizational change intended (Markus 2004). To align both perspectives on technochange projects, the framework implements an integrated view on technological and organizational aspects of a project to ensure that both parts jointly affect an organization. Moreover, from a BM perspective, technochange incorporates highly relevant effects as the time gap between the implementation and realization of beneficial effects (cf. Table 4). Thus, projects have to be up-to-date with emerging changes in the environment and need to iteratively improve technological or change-related aspects (Jackson and Philip 2010). To align both perspectives within a technochange project, the framework implements an integrated view on technological and organizational aspects of a project to ensure that both parts affect an organization intentionally.

Table 4. Four phases of the technochange lifecycle (Markus 2004)

Phase	Chartering	Project	Shakedown	Benefit Capture
Motto	'Ideas to Dollars'	'Dollars to Solution'	'Solution to Usage'	'Usage to Dollars'
Description	Phase during which the technochange idea is proposed, approved, and funded.	Phase during which the technochange solution is developed and technology is acquired or built; ends when technochange starts up or 'goes live.'	Phase during which the organization starts operating in a new way with technology and the organization troubleshoots problems associated with technology and new processes; the goal of the phase is 'normal operations.'	Phase during which the organization systematically derives benefits from the new way of working; may involve continuous improvements, 'upgrades,' and 'conversions' of various kinds.

Markus and Tanis (2000) highlight the dependencies of the activities across all phases of the lifecycle of an IT investment. They introduce the notion of exported problems (Markus and Tanis 2000). Exported problems are issues that remain unresolved in the phase in which these problems originated. Due to the changing management responsibility for each technochange phase, such unresolved problems are likely to be undetected by responsible managers in the following phase. Markus (2004) illustrated that such exported problems can have substantial negative effects on technochange success and, by implication, on benefits realization and exploitation. Thus, successful post-project benefits realization requires not only an effective information flow regarding expected benefits but also an information flow concerning potential project-induced risks for benefits realization across the entire technochange lifecycle.

3.3 Corporate Education Services

Within organizations, CESs comprise activities that relate to the process of learning and acquiring information. Due to changing requirements of customers, markets and technologies, employees need to further develop to cope with these changes (Ahrens et al. 2018; Alavi et al. 2002; Zolnowski et al. 2013). Consequently, CESs are a main form of leverage for organizations to foster organizational change as needed, via disruptions and transformations within several sectors (Ahrens et al. 2018; Ahrens and Gessler 2018; Kriegesmann et al. 2018).

Moreover, CESs are thus characterized as knowledge-intense people-oriented services that have a high degree of interactivity and individuality (Alavi et al. 2002; Menschner et al. 2011). Given these changing conditions, the market potential of CES is increasing. Accordingly, within the European Union the rate of employees participating in CES is raising (Eurostat 2011). As a result, CES rises as a sector as well. In 2015, the clear majority of German organizations offered

CESs (German Federal StatisticalOffice 2017b), and the market volume is growing (Flasdick et al. 2008; Pfeiffer and Kaiser 2009).

As such substantial investments are made, organizations strive for realizing the anticipated benefits of CESs as an improved performance of organizations (Saks and Burke 2012). Accordingly, the aspect of transfer of training is a key outcome of CES. This importance is also mirrored in scientific discourse within human resources management by being the most frequently addressed issue for several years (Jeung et al. 2011). Nevertheless, the full potential is still not realized, and especially support by IT is scarce (Bates 2005; Gupta and Bostrom 2009; Hoic-Bozic et al. 2009).

3.4 Benefits Management

The main driver for investments in IT is the realization of anticipated benefits (Zmud and Cox 1979). Nevertheless, BM was not covered within IS, as the design and conceptualization of IS were deemed appropriate to realize benefits (Silk 1993). A scientific discourse regarding managing the realization of benefits started gaining attention during the mid-1990s through a study conducted in Great Britain (Ward et al. 1996). In the research project, the term "benefits management" is defined as "the process of organizing and managing such that potential benefits

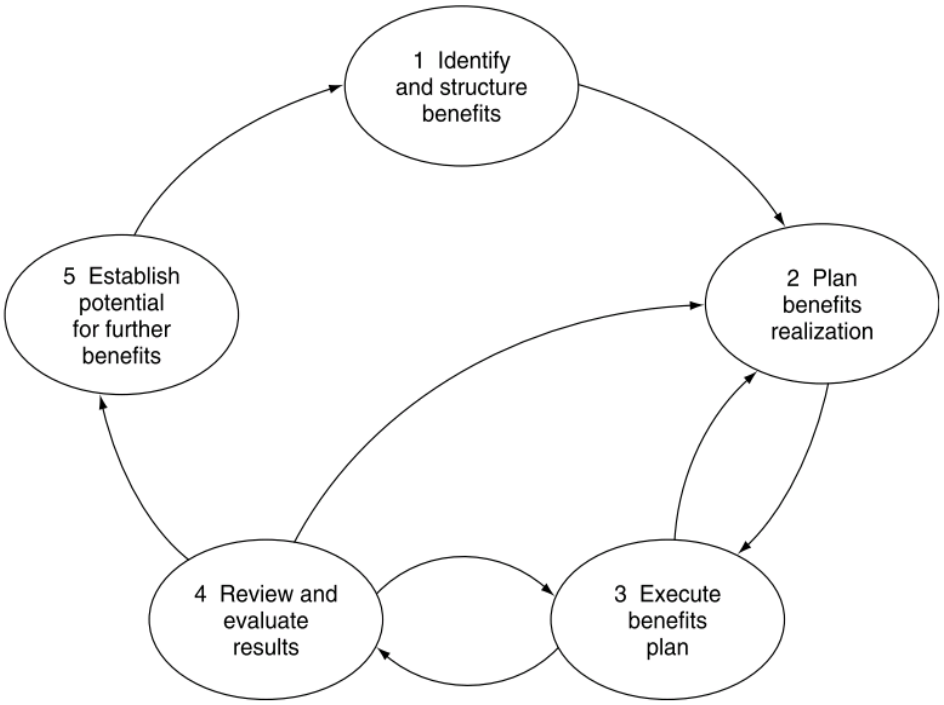

Figure 5. Cranfield Benefits Management Model (Ward and Daniel 2006).

arising from the use of IT are actually realized" (Ward et al. 1996, p. 214). This definition implies that there is a considerable time lag between the development of a solution and the realization of benefits using the solution (Brynjolfsson and Hitt 1998; Marchand et al. 2000; Markus 2004; Orlikowski 1996). Accordingly, organizational phenomena have emergent characteristics; thus, benefits occur, as the results of a project are used (Orlikowski and Baroudi 1991). Another result of this initial study was the Cranfield Benefits Management Model (Ward et al. 1996). This model is widely accepted and serves as the foundation for various research approaches on BM (Ashurst et al. 2008; Eckartz et al. 2012; Ward et al. 1996). It comprises five phases (cf. Figure 5), starting by identifying and structuring benefits (1). Relationships between functionalities and the resultant benefits are observed in this phase. Moreover, ownership and responsibilities for each benefit have to be defined. The results of this phase are integrated into a business case. This is followed by the planning of benefits realization (2). A major outcome of this phase is a finalized business case and a detailed description of each benefit. This phase includes measures as well as agreed responsibilities for benefits realization. The third phase describes the execution of the benefits plan (3). This phase is carried out during the project. The main task in this phase is to monitor the progress of the realization of benefits and to act if risks materialize and unplanned events take place. After the completion of a project, the results should be reviewed and evaluated (4) to determine whether benefits realization was successful. Furthermore, this phase helps to identify benefits that were only partially realized or could not be realized at all. Based on this information, it is possible to act. This supporting function also refers to unexpected benefits that can accrue. Lastly, the potential for further benefits should be established (5). During this phase, further benefits should be identified to consider them for future activities as follow-up projects. This phase is implicitly grounded after the adoption of the project results is completed which relates to the time lag between introduction and the actual realization of benefits in operation.

Besides the late phase of the Cranfield Benefits Management Model, the post-project phase contains no further suggestions for realizing benefits of IT investments that explicitly address the time lag and organizational learning after adoption for benefits realization. Other closely related approaches emphasize the realization of planned benefits by changing organizational work practices (Ashurst 2011; Ashurst et al. 2008; Bradley 2010; Breese et al. 2015; Melton et al. 2011; Odusanya et al. 2015). Most of these approaches recommend tracking benefits realization according to predefined measures, e.g., through a benefits review (Melton et al. 2011).

Others suggest management of planned benefits by linking it to overall performance management functions after the formal closure of a project (Melton et al. 2011) or establishing ownership for continued benefits exploitation (Ashurst et al. 2008).

Overall, the diffusion of formalized BM is rather slow (Ward et al. 2007). Recent reviews of the literature on BM from a project perspective (Braun et al. 2009; Hesselmann and Kunal 2014) make one reason apparent. The studies show that, in post-project phases, there is no established method or concept to support emerging benefits or identified but unrealized benefits, which are also reflected in a qualitative study (Semmann and Böhmann 2015).

According to this, three important aspects of post-project BM can be identified (Semmann and Böhmann 2015). First, post-project BM builds on and relies on benefit-related activities before and during the project. Accordingly, exported problems as stated within technochange, influence benefits realization. Second, the realization and exploitation of benefits only materialize once the output of the project is used in an organization. Thus, post-project BM significantly outlasts the project and needs to be embedded in the usage phase. Lastly, benefits from IT depend on effecting organizational changes that improve the performance of the organization. Considering these three aspects, BM should be conceptualized as an integral part of a wider transformational framework that focuses on improving organizational performance with IT.

4 Publications

4.1 Related publications

As part of this research, 14 publications have been developed and published. Additionally, one publication is currently under revision. All publications directly or indirectly relate to the topic of this thesis and supported elaborating it.

Semmann, M., and Böhmann, T. 2018. "Deconstruction of Post-Project Benefits Management Practice: Deriving Design Principles to Foster Contextual Benefits Realization," Multikonferenz Wirtschaftsinformatik (MKWI) (25), Lüneburg, Germany. (under 1st revision)

Grotherr, C., Semmann, M. and Böhmann, T. 2018. "Engaging Users to Co-Create – Implications for Service Systems Design by Evaluating an Engagement Platform," Hawaii International Conference on System Sciences (51), Waikoloa Village, Hawaii, United States of America: IEEE.

Semmann, M., and Grotherr, C. 2017. "How to Empower Users for Co-Creation - Conceptualizing an Engagement Platform for Benefits Realization," Internationale Tagung Wirtschaftsinformatik (13), St. Gallen, Switzerland.

Semmann, M., and Böhmann, T. 2015. "Post-Project Benefits Management in Large Organizations – Insights of a Qualitative Study," International Conference on Information Systems (ICIS) (36), Fort Worth, Texas, United States of America, p. 16.

Zolnowski, A, Weiß, P., Semmann, M., Amrou, S. (2015): „PROMIDIS Handlungsleitfaden - Dimension Produktivitätscontrolling“.

Amrou, S., Semmann, M., and Böhmann, T. 2015. "Enhancing Transfer-of-Training for Corporate Training Services: Conceptualizing Transfer-Supporting It Components with Theory-Driven Design," Internationale Tagung Wirtschaftsinformatik (WI) (12), Osnabrück, Germany, pp. 195-209.

Semmann, M., Amrou, S., and Böhmann, T. 2014. "Produktivitätsorientiertes Lern Service Engineering," in Produktivität Von Dienstleistungen, K. Möller and W. Schultze (eds.). Springer, pp. 456-471.

Amrou, S., Semmann, M., and Böhmann, T. 2013. "Managing for Transfer of Training: Directions for the Evolution of Learning Management Systems," Americas Conference on Information Systems (19), Chicago, Illinois, USA.

Zolnowski, A., Semmann, M., Amrou, S., and Böhmann, T. 2012. "Identifying Opportunities for Service Productivity Improvement Using a Business Model Lens," The Service Industries Journal (33:3-4), pp. 409-425.

Semmann, M., Amrou, S., and Böhmann, T. 2012. "Analysis of Learning Management Systems According to a Holistic View on Corporate Education Services," SIGSVC Pre-ICIS Workshop, Orlando, FL. http://sprouts.aisnet.org/12-30

Zolnowski, A., Semmann, M., and Böhmann, T. 2012. "Vergleich Von Metamodellen Zur Repräsentation Von Geschäftsmodellen Im Service," Dienstleistungsmodellierung, Bamberg: Springer, pp. 26-48.

Zolnowski, A., Semmann, M., Böhmann, T. (2011): “Metamodels for Representing Service Business Models”. In Proceedings of SIGSVC Workshop. Sprouts: Working Papers on Information Systems, 11(163), Shanghai, China. http://sprouts.aisnet.org/11-163

Zolnowski, A., Semmann, M., Böhmann, T. (2011): “Introducing a Co-Creation Perspective to Service Business Models”. In: Enterprise Modelling and Information Systems Architectures (EMISA), Hamburg, S. 243-248

Zolnowski, A., Semmann, M., Amrou, S., Böhmann, T. (2011): “Identifying Opportunities for Service Productivity Improvement Using a Business Model Lens – Lessons from Corporate Education Services”. In: Proceedings RESER Conference, Hamburg, Germany.

4.2 Included publications

The research questions are answered in a frame of five publications. As one of these is currently under revision at a leading conference, the article is attached in the appendix. In this subsection, all included publications are briefly introduced.

Chapter 9:

Table 5. Summary of appended paper 1

Citation	*Zolnowski, A., Semmann, M., Amrou, S., and Böhmann, T. 2012. "Identifying Opportunities for Service Productivity Improvement Using a Business Model Lens," The Service Industries Journal (33:3-4), pp. 409-425.*
Ranking	WKWI: not listed VHB-JOURQUAL 3: C CORE Ranking: not listed
Type of paper	Research paper
Track	Not applicable
Aim	The aim of the paper is to introduce a business model perspective to identify opportunities for service productivity improvement. The application of a business model perspective thus helps to distinguish expressions of corporate education services. Accordingly, two extreme forms are chosen to describe the field of tension. Additionally, by a business model perspective, a structured analysis of CES is possible.
Methodology	Expert interviews, workshops
Contribution	The paper contributes to research on productivity of complex services. By the analysis, 25 opportunities to improve service productivity are identified. These opportunities heavily rely on the manifestation of the CES.

Co-authors' contribution	The paper is co-authored by Andreas Zolnowski, Sharif Amrou, and Tilo Böhmann. Tilo Böhmann contributed the idea of the paper, revised the introduction and conclusion. Andreas Zolnowski contributed his knowledge on business models and practical experience in corporate education services. Together with Sharif Amrou, he helped to realize the workshops and interviews, discussed the results and provided English proficiency support.

Chapter 10:

Table 6. Summary of appended paper 2

Citation	*Semmann, M., Amrou, S., and Böhmann, T. 2012. "Analysis of Learning Management Systems According to a Holistic View on Corporate Education Services," SIGSVC Pre-ICIS Workshop), Orlando, FL.*.
Ranking	WKWI: not listed VHB-JOURQUAL 3: not listed CORE Ranking: not listed
Type of paper	Research paper
Track	n.a.
Aim	The aim of the paper is to relate CES with service science, especially co-creation and the influence on service productivity. Additionally, the state of practice of learn management systems is assessed regarding the ability to support these influencing factors.
Methodology	Literature review
Contribution	This paper contributes to CES as it combines a perspective on the outcomes of corporate education with a service perspective. Based on this point of view LMS are analyzed and gaps on different levels of outcomes are identified. Thus, these gaps help to improve IT-supported CES to foster the realization of anticipated effects of corporate trainings.
Co-authors' contribution	The paper is co-authored by Sharif Amrou and Tilo Böhmann. Sharif Amrou helped identify core functionalities of learning management systems and helped to discuss the results. Tilo Böhmann contributed the idea of the paper and revised the introduction and conclusion.

Chapter 11:

Table 7. Summary of appended paper 3

Citation	*Semmann, M., and Böhmann, T. 2015. "Post-Project Benefits Management in Large Organizations – Insights of a Qualitative Study," International Conference on Information Systems (ICIS) (36), Fort Worth, Texas, United States of America, p. 16.*
Ranking	WKWI: A VHB-JOURQUAL 3: A CORE Ranking: A*
Type of paper	Research paper
Track	Practice-Oriented Research
Aim	The aim of the paper is to assess current state of practice regarding BM within the technochange lifecycle. Hereby, the focus is on chartering, shakedown, and benefits capture phase, as these are not investigated in prior research.
Methodology	Expert interview
Contribution	The paper contributes to BM and IT-driven organizational change, as the state of practice is evaluated. Based on these insights, shortcomings are identified that lead to the derivation of implications that help foster realization of benefits in general and especially after formal closure of projects.
Co-authors' contribution	The article was co-authored by Tilo Böhmann. He contributed to the idea of the paper, helped gaining access to the experts and conducting the interviews. Additionally, he revised the introduction, discussion and conclusion of the paper.

Chapter 12:

Table 8. Summary of appended paper 4

Citation	*Semmann, M., and Grotherr, C. 2017. "How to Empower Users for Co-Creation - Conceptualizing an Engagement Platform for Benefits Realization," Internationale Tagung Wirtschaftsinformatik (13), St. Gallen, Switzerland.*
Ranking	WKWI: A VHB-JOURQUAL 3: C CORE Ranking: C
Track	Dienstleistungssysteme und hybride Wertschöpfung
Aim	The aim of the paper is to utilize the design principles derived in this thesis(Semmann and Böhmann 2015; Semmann and Böhmann 2018) and accordingly instantiate an engagement platform. This platform is applied in the context of the introduction of a software at the participating company. Additionally, the aim is to gain insights on how to apply the design principles and identify decisions necessary to create value with the artifact in a distinct environment.
Methodology	Design Science Research Method
Contribution	The paper illustrates how contextualize general design principles. Thus, it combines research on BM – represented within the design principles – service systems engineering, and internal crowdsourcing. By contextualizing the design principles, several design variables are identified that need to be considered while applying the design principles. Additionally, the paper contributes to service systems engineering as it demonstrates how engagement platforms can be instantiated and aligned with an organization.

Co-authors' contribution	The article was co-authored by Christian Grotherr. He added foundations on internal crowdsourcing and revised the design variables and conclusion.

Chapter 14: Appendix A

Table 9. Summary of appended paper 5

Citation	*Semmann, M., and Böhmann, T. 2018. "Deconstruction of Post-Project Benefits Management Practice: Deriving Design Principles to Foster Contextual Benefits Realization," Multikonferenz Wirtschaftsinformatik (MKWI) (25), Lüneburg, Germany. (under review)*
Ranking	WKWI: C VHB-JOURQUAL 3: D CORE Ranking: -
Track	Der Kunde in der Digitalen Transformation – Creating Customer Values
Aim	The aim of the paper is to identify intentions of organizations by applying BM approaches. These results are deemed beneficial for further elaborating on the construction of artifacts that foster the realization of benefits.
Methodology	Expert interviews
Contribution	By identifying core intentions of BM approaches, the strategy of organizations relating to benefits becomes transparent. Thus, the results were used to derive design principles that incorporate theoretical knowledge on service systems as well as the state of practice. Consequently, the design guidelines contribute to BM as they bridge the gap between scientific concepts and practice.
Co-authors' contribution	The article was co-authored by Tilo Böhmann. We jointly developed the idea of the paper and he gave feedback for the discussion of the results.

5 Research Contribution

As this dissertation integrates two research streams with the overall goal to design and improve service systems for benefits realization, it contributes to several areas of research. Consequently, the following section focuses on the overall research contribution. Subsequently, distinct contributions to the area of service systems, IT-driven organizational change, CES, and BM are described.

5.1 Overall Research Contribution

Service Science (Grönroos 1983; Lusch and Vargo 2006c; Ravald and Grönroos 1996; Satzger et al. 2010) and research on IT-driven organizational change (Benjamin and Levinson 1993; Markus and Robey 1988; Orlikowski and Hofman 1997; Zmud and Cox 1979) have emerged and were established separately. Nevertheless, both disciplines are related inasmuch the realization of benefits for involved actors is part of both disciplines. Within service science, value is deemed as contextual and jointly created (Chandler and Vargo 2011; Maglio and Breidbach 2014; Vargo and Lusch 2008a). IT-driven organizational change literature focuses on realizing benefits by effecting change in organizations (Markus 2004; Zmud and Cox 1979). This research is informed by and contributes to both domains (cf. Figure 6).

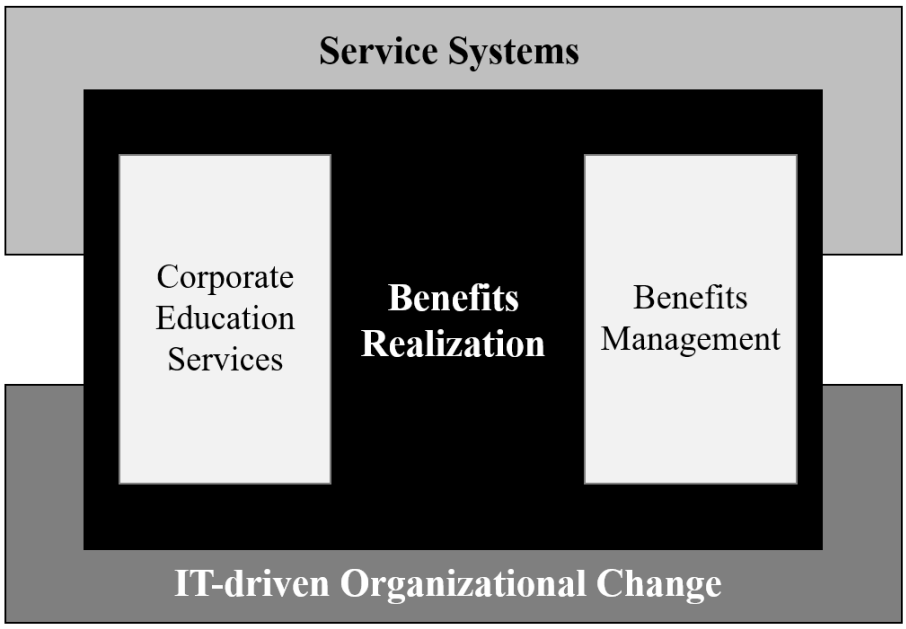

Figure 6. Research areas to which this dissertation contributes.

Source: Own representation

Overall, four main contributions to research are made. First, this thesis contributes to SSE by applying and adapting methods to analyze service systems (Semmann and Böhmann 2015; Zolnowski et al. 2012). Additionally, an engagement platform is instantiated and thus helps understand how service systems can be developed (Grotherr et al. 2018; Semmann and Böhmann 2015; Semmann and Böhmann 2018; Semmann and Grotherr 2017). Second, this research contributes to IT-driven organizational change by applying a technochange perspective in the two domains of this research. Thus, distinct learnings in these settings are derived by analyzing the domains (Semmann and Böhmann 2015; Zolnowski et al. 2012), identifying inhibitors and opportunities to complement change (Semmann and Böhmann 2015), and proposing design principles to effect IT-driven organizational change that are applied within a design science research project (Grotherr et al. 2018; Semmann and Böhmann 2015; Semmann and Böhmann 2018; Semmann and Grotherr 2017). Third, this thesis helps to analyze and further develop CESs by proposing factors that need explicit consideration while developing CESs (Zolnowski et al. 2012). Additionally, a review on software to complement corporate education systems is done with the aim to study their effect on organizational benefit as a main output of CESs (Semmann et al. 2012). The fourth area this research contributes to BM with a focus on software services. Within this thesis, a comprehensive analysis of current practice of BM is done (Semmann and Böhmann 2015). This is the first qualitative research on large organizations and their application of methods and approaches on BM with a focus on the post-project phase. Furthermore, design guidelines for BM after a formal closure of a project are derived (Semmann and Böhmann 2018) and instantiated within a real-world setting (Grotherr et al. 2018; Semmann and Grotherr 2017).

By integrating these contributions, benefits realization is fostered by improved service systems. Each part of the cumulative work contributes to this overall goal. Within CESs and regarding BM with focus on software services, a broader understanding of opportunities and inhibitors for benefits realization is gained (Semmann and Böhmann 2015; Zolnowski et al. 2012). Thus, these results were applied in both domains to broaden the understanding of benefits realization and propose transferable contributions (Semmann et al. 2012; Semmann and Böhmann 2018). Regarding BM for software services, these results have been instantiated and been further refined to improve the service system and thus increase realization of benefits (Grotherr et al. 2018; Semmann and Grotherr 2017).

Both design science projects in this thesis are described according to the context-process-outcome-resources framework proposed by Denison et al. (1996)and further elaborates on by Iivari (2015). By doing so, a structured overview and comparison is given. Accordingly, the application of the framework is narrowed to aspects that are appropriate for the research streams. The results are depicted in table 10.

Table 10. Contrasting the research streams (adapted based on (Denison et al. 1996; Iivari 2015)).

Dimension		**Corporate Education Services**	**Benefits Management**
Context	1. Researcher-client relationship	Close relationship with service provider and loose relationship with stakeholders of the customer.	Close relationship with all hierarchy levels within the organization, high efforts to establish and maintain it.
	2. Major problems to be addressed	Transfer of training as a key driver of organizational change not addressed sufficiently (Semmann et al. 2012).	Users lack power and opportunity to foster change after formal closure of software projects (Semmann and Böhmann 2015).
	3. Uncertainty of the DSR project	High as the commitment of provider and customer have to be long-term oriented to realize effects.	High as the concept changes current work practice to a bottom-up approach for change and the concept is new within the organization. Thus, engagement is needed but uncertain.

Dimension		Corporate Education Services	Benefits Management
Outcomes	4. Artifacts built	• Levers for productivity improvement (Zolnowski et al. 2012) • Requirements for transfer-oriented IT components (Semmann et al. 2012) • [Further artifacts, not incorporated within this thesis have been developed (Amrou et al. 2013; Semmann et al. 2014)].	• Implications for benefit management practice in post-project phase (Semmann and Böhmann 2015) • Design guidelines for an engagement platform (Semmann and Böhmann 2018) • Prototypical implementation of an engagement platform (Semmann and Grotherr 2017).
	5. Primary role of the real system implementation	Proof of concept.	Solution for a real-world problem.
	6. Nature of the IT meta-artifact	Novel concept of IT-supported transfer of training.	Novel design principles that incorporate SSE and IT-driven organizational change.
	7. Practical relevance	High relevance, as the involved service provider and customer are still engaged within this research (Amrou and Böhmann 2016).	High, as the need for better concepts in practice is identified (Semmann and Böhmann 2015) and the engaged organization fosters the further development of the artifact (Semmann and Grotherr 2017).
	8. Research methods	Qualitative Methods • Interviews • Workshops.	Qualitative Methods • Workshops • Interviews • Thinking-Aloud.
	9. Generalization	Included in the problem statement (Semmann et al. 2012).	Generalization by deriving implications based on current practice (Semmann and Böhmann 2015) and design guidelines (Semmann and Böhmann 2018).

Source: Own representation

Regarding the area "context," three aspects are relevant. The researcher-client relationship is close in both design science research projects. Within CES, the relationship is multilevel as a relation with the CES provider is established and its customers are engaged. Within the BM for service systems project, a close relationship throughout the organization is needed to gain commitment and support on the management level to implement a bottom-up change platform. Moreover, a close relation with non-managerial employees is critical for success, as the platform addresses end-users to co-create and hereby change organizational practice.

The major problem addressed in the first stream is the need to improve the outcome of CESs to leverage organizational change by enhancing the transfer of training. The major problem in BM is the lack of power and opportunity of users to improve and change software during the usage phase of it, in contrast to a project where users are engaged in various ways.

Resulting from the high degree of engagement, the research streams contain uncertainties. Within the CES context, a long-term relationship and willingness to participate are necessary to realize anticipated effects. Despite the positive initial relation, this leads to uncertainties within the project. For BM, this is an uncertainty as well. Even more, several levels of hierarchy are involved and need to engage. Additionally, the cultural fit of the approach is uncertain as the shift from top-down initiated change to bottom-up change initiatives is drastic.

Within the dimension "outcomes," five facets are addressed to differentiate both research streams. The artifacts built for the CES project are a set of factors that help service providers to increase the productivity of their services (Zolnowski et al. 2012). Additionally, requirements for transfer-oriented IT components, affecting organizations with CESs, are derived (Semmann et al. 2012). Based on these results, further research not included in this thesis lead to the development of IT components to support transfer of training (Amrou et al. 2013; Semmann et al. 2014). Within the BM project, three artifacts are built. First, implications for benefit management practice are derived based on a qualitative study in large organizations (Semmann and Böhmann 2015). Second, design guidelines for engagement platforms are proposed that help to substantiate service systems (Semmann and Böhmann 2018). Third, an engagement platform is implemented and instantiated at the organization that collaborated within this research (Grotherr et al. 2018; Semmann and Grotherr 2017).

The primary role of the artifact is in the CES context to proof the concept of enhancing the outcome of CESs to lever organizational change with the support of IT. In the BM setting, the primary role is to solve a real-world problem by bridging the gap between software introduction projects and the actual use of the software to realize benefits.

The third facet to compare the research projects is the nature of the IT meta-artifact. For CES, the nature of the IT meta-artifact is a novel concept of IT-supported transfer of training that aims for behavioral change of the employees that leads to organizational change. Within BM,

the nature of the IT meta-artifact is a novel concept for engagement platforms that employs knowledge of SSE and IT-driven organizational change.

Relevance for practice can be depicted as high in both projects. Regarding CES, this is mirrored in the ongoing participation and broadening of the organization (Amrou and Böhmann 2016). For BM, the relevance is high as well, based on the problem-centered initiation (Semmann and Böhmann 2015) and the ongoing commitment of the participating organization (Semmann and Grotherr 2017).

Applied research methods within both projects are qualitative. Workshops and interviews are used as the main method to collect data. In the BM project, additional thinking-aloud tests were utilized to increase the understanding of the prototype.

Finally, the *generalization* of the results is another aspect to contrast the research projects. The results of CESs are generalizable, as they are included within the problem statement that refers to a widely accepted area of action (Semmann et al. 2012). The results of BM are generalizable as well, and practice-based implications are derived (Semmann and Böhmann 2015) as well as general design guidelines for engagement platforms (Semmann and Böhmann 2018).

5.2 Contributions to Service Systems Engineering

As a novel discipline within service science, SSE calls for evidence-based, cumulative research (Böhmann et al. 2014) that is also mirrored in design-oriented research (Iivari 2015; Niederman and March 2012). By utilizing a multiphase multi-method research strategy, contributions for SSE can be derived in two domains based on evidence. Building on the concept of value in context, this research also contributes to the goal of increasing benefits realization.

Within this thesis, three approaches to analyze service systems are utilized that help to broaden the set of methods used within SSE. First, within the research on CESs, the analysis focused on co-creation of value and consequently linked to the concept of value in use and value in context. This led to the investigation of indicators that respond to unrealized potentials for productivity improvements in CESs (Gabriel et al. 2007). To ensure a system-level view on the service system and to differentiate instantiations of CES, a business model perspective is applied (Zott et al. 2010). Therefore, the business model canvas was utilized, as it is accepted in research and

related to practice (Osterwalder and Pigneur 2010). The latter aspect is of major relevance, as this perspective was applied within workshops and several interviews.

By analyzing the service system jointly with practitioners, 25 levers are identified that help differentiate CESs regarding the realization of co-creation – standard services versus highly customized services – and leading to potential for improving the overall productivity of the service system (Zolnowski et al. 2012). Thus, the applicability of a business model perspective to analyze service systems was substantiated.

Second, as service systems represent "complex socio-technical systems that enable value co-creation" (Böhmann et al. 2014, p. 73), the research on BM should utilize a broad focus to represent dynamics within organizations that lead to adaptations within service systems. This broad focus is taken by applying the technochange framework to investigate the practice of BM, as it covers IT-driven organizational change projects from its first appraisal into the usage phase (Semmann and Böhmann 2015). The analysis was done by 12 interviews that focused on the early and late phases of technochange lifecycle. The study lead to a comprehensive overview of benefits-related methods applied in large organizations and thus adds a novel frame to investigate service systems based on the technochange framework. Additionally, the state of practice regarding awareness of and focus on benefits realization is surveyed.

The third approach to analyze service systems is done within an extensive DSRM project with a large public organization in Germany (Semmann and Grotherr 2017). Within this iterative process, the service system in focus is the organization-wide introduction of software. To investigate the service system from a BM perspective, 17 interviews were conducted based on guidelines that incorporate change management (Kotter 2007) and technochange (Markus 2004). Additionally, five workshops on different management levels were conducted to further shape the understanding of the service system. Thus, this work contributes to SSE, as it demonstrates the applicability of SSE within design science. Additionally, this work contributes a more detailed perspective on efforts to realize benefits within software services in a large organization.

Beyond the analysis of service systems, this thesis contributes to the design of service systems by developing design principles. Building on the results of the qualitative study (Semmann and

Böhmann 2015), design principles are derived that foster the realization of benefits from a value in context perspective. These principles are depicted in table 11.

Table 11. Relation of design principles and their fundamental core intentions.

Design Principle		**Core Intention**
DP 1	Integrate future users throughout the whole lifecycle	CI 1, 2, 3, 8
DP 2	Revalidate alignment with business needs and circumstances regularly	CI 1, 4
DP 3	Assess, monitor, and manage risks regarding benefits realization	CI 5, 6, 8
DP 4	Identify potential improvements, adaptations and needs with an action-oriented approach constantly	CI 1, 2, 3, 4, 7, 8
DP 5	Enforce continuity regarding responsibilities for benefits that outlasts the project	CI 1, 2, 3, 4
DP 6	Foster realization of anticipated benefits by creating opportunities for actors to perform	CI 2, 3, 7, 8

Source: (Semmann and Böhmann 2018)

Based on these design principles, service systems can be designed that utilize the potential of the usage phase of socio-technical artifacts to further enhance the realization of benefits. Thus, these principles broaden the understanding of contextualization of service systems and its beneficial use.

Accordingly, within the specific context of BM, the design principles are operationalized to derive objectives of a solution that enables users of software to co-create change initiatives (cf. Table 12). Based on these objectives an engagement platform is designed, that materializes as an intermediate layer to enable engagement of actors and resources (Semmann and Grotherr 2017). Thus, it instantiates the integration of resources within a service system.

Table 12. Objective of the proposed solution

No.	Objective	Source
O1	Enforce continuity of benefits management that outlasts projects	(Semmann and Böhmann 2015)
O2	Accompany transition and early usage phases with an ongoing action-oriented approach instead of only a retrospective one	(Semmann and Böhmann 2015)
O3	Identify emergent benefits after the transition is completed and regular work practice is achieved	(Majchrzak et al. 2016; Semmann and Böhmann 2015)
O4	Establish ways to deal timely with improvements	(Patora-Wysocka 2016; Semmann and Böhmann 2015)
O5	Mobilize resources to enable user-driven change	(Böhmann et al. 2014; Lusch et al. 2016; Peters et al. 2014; Storbacka et al. 2016; Vargo and Lusch 2016a)
O6	Establish a platform that allows actors to engage	(Breidbach et al. 2014; Storbacka et al. 2016)

Source: (Semmann and Grotherr 2017)

Based on these operationalized design principles, this thesis contributes to SSE by extending a service system within an organization (Semmann and Grotherr 2017). Designing an artifact by applying DSRM results in close engagement with the participating organization. Thus, the service system is extended and shaped reciprocally. This process leads to insight on the design of service systems that extends the perception of the engagement platforms as it instantiates it, leading to evidence-based reasoning (Semmann and Grotherr 2017).

5.3 Contribution to IT-driven Organizational Change

As research confirms that besides technological change, organizational change have to be considered to succeed with IT by realizing benefits (Bradley et al. 2006; Coombs et al. 2001; Gregor et al. 2006), this thesis contributes to IT-driven organizational change on both sides of the continuum. Regarding organizational change that is amplified by IT, the research stream on CESs builds on corporate education as a central instrument to implement organizational change, especially if the aim is to change participant behavior. This aim is mirrored in the four-level model of evaluation for CESs (Kirkpatrick 1996). The model depicts the scope of CESs to evaluate its effectiveness. The highest two level represent change in behavior and change in results, thus representing organizational change. By employing this perspective and analyzing LMSs based on it, an overview of IT support on these levels is given (Semmann et al. 2012). The findings show that the results level is partially covered by LMS and the behavior level is not supported by LMSs. Thus, potentials for amplifying the effectiveness of CESs by IT are identified, leading to realized benefits. These research gaps are covered within publications not

included in this thesis (Amrou et al. 2013; Semmann et al. 2014) and elaborated by another dissertation project (Amrou and Böhmann 2016).

By conducting a qualitative study on post-project BM, this thesis contributes to IT-driven organizational change, as it substantiates the state of practice in this field (Semmann and Böhmann 2015). Thus, a broad range of approaches taken by organizations are identified. During the pre-project phase, business cases and portfolio management approaches are taken by all organizations to ensure timely and cost-efficient project appraisals. After the project, it comes clear that most organizations do consider benefits, but without assessing the effects on the organization and the ongoing realization of benefits. All approaches are entirely retrospective and thus do not foster organizational change within the usage phase. Consequently, inhibitors seem to limit organizational practice despite a considerable body of knowledge on BM in science. Based on this practice-research gap, implications are derived to guide IT-driven organizational change after the closure of a project (cf. Table 13).

Table 13. Implications for benefits management practice

Phase	Implication
General	• Enforce continuity regarding management of benefits that outlasts projects (I1)
Project	• Integration of users and iterative development to gain better understanding of work practice to improve solution fit (I2)
Post-project	• Accompany transition and early usage phases with an ongoing action-oriented approach instead of only a retrospective one (I3) • Identify emergent benefits after the transition is completed and regular work practice is achieved (I4) • Establish ways to deal with improvements through timely follow-ups (I5)

Source: (Semmann and Böhmann 2015)

By further elaborating on these issues, IT-driven organizational change is linked with SSE to build on expertise to develop and refine service systems to foster the realization of benefits and thus organizational change (Semmann and Böhmann 2018). The resulting design principles build on this relation by incorporating change-oriented activities of practitioners that embody the concept value in context leading to applicable engagement platforms to instantiate service systems.

The third contribution to IT-driven organizational change is the explication and instantiation of BM within an organizational context (Semmann and Grotherr 2017). Building on the design principles, an instantiation is developed in a specific organizational setting. Doing so led to 17 design variables that influence the effect of the socio-technical artifact on organizational

change. In the context of the design science approach of BM, the artifact currently under evaluation seeks to realize organizational change by establishing an engagement platform that associates actors to engage, develop, and refine changes in software and the use of the software. Thus, organizational change is complemented by IT and builds on a bottom-up approach to further develop contextualized use of software.

5.4 Contribution to Corporate Education Services

A core instrument of organizational change is training employees to gain knowledge, adapt and change behavior and thus collectively change an organization (Dubois 1993; Jacobs 2002; Neirotti and Paolucci 2013; O'Keeffe 2002; Olsen and Stensaker 2014). As IT has the potential to complement and foster this change (Markus 2004), this thesis contributes to CESs by deriving requirements for IT components ordered by the four-level model of evaluation (Semmann et al. 2012), thus representing facets that combine to supplement organizational change (cf. Table 14). These requirements contribute to a broader coverage of IT components throughout the lifecycle of CES.

Table 14. Requirements of the four-level model (based on Wang and Wang 2005).

	Requirements
Reaction (L1)	Providing learning materials Supporting communication of the participants Providing accommodation and other prevailing circumstances
Learning (L2)	Supporting the learning process
Behavior (L3)	Supporting the transfer of knowledge to the job
Result (L4)	Aligning the educational service with its intended goals

Source: (Semmann et al. 2012)

Building on the derived requirements, as IT components that focus on supporting learning services, LMSs were analyzed. By doing so, this thesis proposes an overview of currently well-supported aspects of CESs and identifies gaps (Semmann et al. 2012). As the mapping of the requirements and typical LMS functionalities show, there is a lack of supporting IT components that decidedly address behavioral learning, change, and only partial support on the result level (cf. Table 15). Thus, this thesis identifies structural shortcomings in IT-supported CESs that should and are addressed in further research (Amrou and Böhmann 2016; Amrou et al. 2013).

Table 15. Mapping of learning requirements with typical functions of learning management system

	Requirements according to Kirkpatrick
Manages e-learning	L1 a
Management of classroom, instructor-led (ITL) training	L1 a, b, c; L2 a
Performance reporting of training results	L4 a
Learner collaboration	L1 b; L2 a
Keeping learner profile data	L1 a, L4 a
Sharing learner data with an ERP system	L4 a
Competency mapping - skill gap analysis	L4 a
Creates test questions and test administration	L2 a
Management of learning programs and planning (Event scheduling)	L1 c; L2 a

Source: (Semmann et al. 2012)

The final contribution to the field of CESs is done by applying a business model perspective on CESs (Zolnowski et al. 2012). This approach helps to analyze the field of tension of CESs. It delivers exemplary insights into distinctive configurations of business models in CESs. Thus, it contributes to the understanding of design decisions that influence the productivity of CESs by distinguishing standard training services from highly individualized training services. The results are 25 levers within a business model that shape service productivity, helping CES research improve facets or the general productivity within CESs.

5.5 Contribution to Benefits Management

BM evolved as a research stream that is strongly related to project management (Ashurst 2015; Ashurst et al. 2008; Eckartz et al. 2012; Peppard et al. 2000; Peppard et al. 2007; Ward and Daniel 2013; Ward and Elvin 1999; Ward et al. 1996). This thesis broadens this narrow perspective, as it combines SSE, particularly the concept of value in use with BM (Semmann and Böhmann 2018). Thus, it regards empirical evidence on the emergent character of organizational change (Brynjolfsson and Hitt 1998; Markus 2004; Upton and Staats 2008). This extension of BM reflects the scarce application of scholarly BM approaches within practice (Ward et al. 2007) and builds on approaches taken in practice (Semmann and Böhmann 2015). By analyzing the current state of practice, the following shortcomings are identified: (1) *responsibility* for benefits is not enduring within the usage phase of projects results and (2) *during the project phase, management is not consequently implemented*, which is caused by dynamic

changes in the environment of a project, resulting in inferior benefits realization. The third shortcoming is the (3) *lack of proactive approaches* in the usage phase that could deal with emerging benefits and changing environmental conditions.

Building on these shortcomings and literature on SSE, design principles are derived that integrate value in context, resource mobilization, and engagement as central aspects of SSE. These design principles extend research on BM, as they propose a foundation for further application that considers BM within projects but also relates to the transition and usage phase, as these phases contextualize project results (Semmann and Böhmann 2018).

Guided by these design principles, an engagement platform within a complex, socio-technical service system is designed and instantiated (Grotherr et al. 2018; Semmann and Grotherr 2017). Thus, the applicability and utility of the design principles are demonstrated. Using the design principles leads to the identification of contextual design variables that need to be considered to implement an engagement platform to realize benefits. These 17 variables support a contextual instantiation of the design principles to meet organizational needs. Thus, engaging users after a project and within the usage phase of software in a real-world environment demonstrates that extending the perspective of BM is worthwhile and has the potential to strengthen this research stream.

6 Practical Contribution

Besides the theoretical contribution, this thesis contributes to practice as well. First, it contributes in relation to the two overarching research areas and within the domains in which the research is grounded.

6.1 Overall Practical Contribution

The research conducted within this thesis is relevant for practice, as it depicts and connects theoretical foundations and applies them in organizational contexts. As a service systems perspective embodies a view on complex socio-technical artifacts that are incorporated to realize value by engaging actors and resources, this thesis contributes by delivering design principles that are applicable and relevant for practice, as every research included in this thesis is grounded in practice. Each piece of research builds on data collected in practice or reflects on the application of approaches and tools in practice. Figure 7 depicts the genesis of the practical contribution.

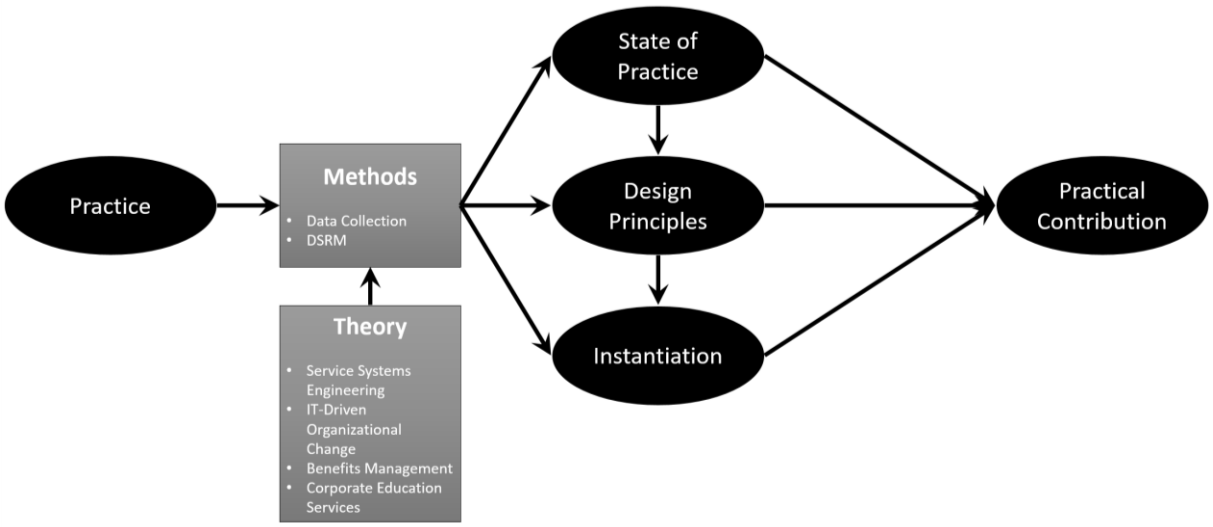

Figure 7. Derivation of the practical contribution.

Source: own representation

6.2 Designing IT-supported Learning Service Offerings to Foster Organizational Change

Considering CESs that aim for behavioral change and extending methodological knowledge, despite, for example, training solely on the use of software, two contributions are made within this thesis. By adopting a business model perspective, providers and customers of CES can

differentiate instantiations regarding their alignment with the intended organizational change. Thus, an organizational change-oriented perspective is applied (Dubois 1993; Jacobs 2002; Neirotti and Paolucci 2013; O'Keeffe 2002; Olsen and Stensaker 2014). Doing so enhances the ability to sustain change within organizations. Additionally, this thesis demonstrates how current LMSs can support this change and locate where weaknesses exist. Consequently, this overview enables service providers and customers to bridge these gaps of current IT support and demand by establishing workarounds or fostering the adaptation of utilized software to assist organizational change to be more complete. A instantiation of such supporting IT artifacts is already part of other research (Amrou and Böhmann 2016; Amrou et al. 2013; Semmann et al. 2014).

6.3 Understanding and Building on Benefits Management Practice

Despite enduring scholarly efforts, scientific approaches to manage benefits are scarcely practiced (Semmann and Böhmann 2015; Ward et al. 2007). Thus, an overview of applied approaches for BM is given. Additionally, shortcomings of these approaches are identified. This enables an assessment and advancement of organizational practice. Additionally, implications to improve BM with a focus on transition and the early use phase are derived that help practitioners design processes and roles and ensure accountability to enhance the realization of benefits.

As this thesis elaborates on the concept of value in use and value in context regarding BM, the scope on evaluating IT projects is broadened. As of now, the critical criteria that a project has to meet are budget, time, and quality (Joosten et al. 2014; Nelson and Morris 2014; Petter et al. 2012; Smithson and Hirschheim 1998). As empirical evidence shows that value materializes after a projects solution is in use (Marchand et al. 2000), this thesis enables practitioners to foster the realization of benefits and value by utilizing concepts of service systems (Semmann and Böhmann 2018; Semmann and Grotherr 2017). This insight is mirrored in a prototypically implemented platform that showcases how benefits can be realized within the usage phase by utilizing an internal crowd (Semmann and Grotherr 2017).

6.4 Engaging Users to Realize the Potential of IT-driven Organizational Change in Context

A main driver for organizational investment in IT is to enable and supplement organizational change (Brynjolfsson and Hitt 2000; Cha et al. 2015; Gregor et al. 2006; Majchrzak et al. 2016;

Markus and Benjamin 1997; Matt et al. 2015; Orlikowski 1996; Venkatraman 1994). This driver gains even more importance as organizations encounter the trend of digital transformation (Bilefield and Seitz 2016; Loebbecke and Picot 2015; Majchrzak et al. 2016; Matt et al. 2015; Warg and Engel 2016). Given these developments in organizational practice, a major challenge is to perpetuate the change and to engage employees sustainably in this change. The state of the art is to engage some users within projects that focus on IT-driven organizational change (Conforto et al. 2016; He and King 2008). Consequently, engaging all employees that will be affected by changes is impossible. Thus, organizations have to bridge the gap between involved and excluded users. This thesis demonstrates how this gap can be bridged by proposing design principles of an engagement platform with the focus to realize benefits in IT-driven organizational change (Semmann and Böhmann 2015; Semmann and Böhmann 2018). Based on these design principles, an exemplary engagement platform is designed and introduced in an organization (Semmann and Grotherr 2017). By transparently reflecting on design decisions in this setting, practitioners are enabled to apply the results in organizations and thus can cope with current inhibitors of IT-driven organizational change, sustaining the transformation.

7 Limitations

Like all research projects, the publications within this doctoral thesis are subject to some limitations, moreover this thesis combines research in the research areas SSE and IT-driven organizational change within two distinct domains. This section addresses general limitations of the doctoral research project and the methods applied. Specific limitations of each part of the research are directly addressed within the publication. In general, cumulative research takes time; thus, the publications contributing to this thesis were written over a period of five years. Within this time, research regarding theory and methodology as well as the author´s understanding of the different domains and research areas have progressed. This is also mirrored in the application of the methods and concepts. Besides these general limitations of cumulative doctoral theses, the close engagement of organizations inherent in data collection of all included publications affects the spectrum of facets covered in the publications.

Additionally, the research area of SSE is rather new. Thus, no broadly accepted understanding has evolved. Within this thesis, a broad definition of service systems is applied that focuses on the inherent complexity of a socio-technical artifact that seeks to integrate resources and actors to realize a specific value proposition (Böhmann et al. 2014).

Taking a methodological point of view, three aspects limit the thesis: (1) *Limitations of qualitative interviews and workshops*. As these methods were used within the publications to derive data on specific organizations or domains, the explanatory power is limited to these realms. Accordingly, generalizations only apply within the realm of organization and domain (King and He 2005). Additionally, qualitative research relies on the quality of the participating experts, their statements, and potential biases (Rosenthal and DiMatteo 2001). Consequently, the outcome of the research process depends on the quality of the input in terms of collected data. The time of data collection influences the quality as well, as organizations have dynamic environments and internal dynamics that influence the current perception of an organization at the time of the collection.

(2) *Limitations of Design Science Research Model.* As applied in this research, DSRM is an iterative approach to design artifacts that seek to solve specific organizational challenges (Hevner et al. 2004; Iivari 2015; Peffers et al. 2007). Thus, researchers and their constructed

artifacts have to engage over a long period with a participating organization and the environmental and organizational changes of this organization. As a result, the artifact developed within this thesis is still changing according to emergent organizational needs. Thus, it is not yet evaluated in entirety. Thus, the instantiation of an engagement platform still needs refinement and cannot be transferred in different organizational contexts without reevaluating the design decision made relating to the identified design variables. Nevertheless, the design principles and design variables are on a general level and not specific for the participating organization. This generality of the two design-relevant artifacts is mirrored in the adaptability of the engagement platform under changing circumstances.

(3) *Limitations of evaluating the results.* As this thesis consists of research in two domains and long-term research projects, not all results are included within this cumulative work. Especially, the insights within the CES domain is not evaluated within this research but was used as foundation for another dissertation project. Within this project, the results are evaluated (Amrou and Böhmann 2016; Amrou et al. 2013; Semmann et al. 2014). Relating to BM, a final summative evaluation is not performed as well. As stated before, this is due to the ongoing refinement and adjustment of the implemented artifact and due to establishing further processes to align the engagement platform with organizational processes. In general, measuring the effectiveness of engagement platforms in SSE is still challenging as ways of assessing them are still scarce (Storbacka et al. 2016).

8 Implications for Further Research

Given the contribution and limitations of this thesis, several avenues for future research are open that seem beneficial for research as well as practice.

8.1 Service Systems Engineering

In service science, SSE is a novel discipline (Alter 2011; Alter 2012; Böhmann et al. 2014; Leimeister 2012; Maglio et al. 2009). Within the domain of this thesis, several vantage points for future research evolve. The focus of this thesis is set on gaining knowledge on analyzing and establishing service systems to effect IT-driven organizational change. Consequently, the manifestation of value in use and value in context are the main drivers within this thesis. By developing and implementing a service system to enable users to realize change within an organization, this thesis showcases the use of contextualized creation of value (Semmann and Grotherr 2017). Further research should seek to develop methods that build on the proposed design principles and design variables and thus, enable researchers and practitioners to realize service systems. As evidence-based research is needed in SSE (Böhmann et al. 2014), further applications of the proposed engagement platform should be done. By doing so, another shortcoming of the current research on SSE could be tackled. As value in use and value in context are difficult to empirically asses, actor engagement should be operationalized within the further applications and thus contribute to broadening the understanding of micro-level actor engagement and its relation to macro-level value co-creation (Storbacka et al. 2016). Such research could contribute methodologically as well as by developing a theory that describes the relation of value co-creation and actor engagement.

Furthermore, this thesis utilizes the concept of internal crowdsourcing for engaging users. Based on this bottom-up approach to realizing benefits, it seems worthwhile investigating patterns of resource integration and co-creation within this platform. Research on such patterns could strengthen SSE, especially designing and assessing service systems. Despite this piece of research, further effort is needed to broaden the knowledgebase on engagement platforms methodologically and empirically, especially as internal crowdsourcing does not necessarily apply to each organizational environment or service system as an approach to integrate resources.

8.2 User-centered Benefits Management

Within this research, the focus of BM on projects is criticized. Based on the service science literature, value is realized in distinct environments that apply socio-technical artifacts (Böhmann et al. 2014; Edvardsson et al. 2011; Ng and Smith 2012; Vargo et al. 2008) and empirical evidence (Marchand et al. 2000; Semmann and Böhmann 2015). Accordingly, solely focusing on management of benefits within the runtime of projects and not in the usage phase of project results does not realize the full potential of benefits realization. Thus, based on this thesis, several points of reference for further research become apparent. First, research should seek to gain insight on how BM can be implemented as an ongoing business function. Within IT service management, some processes like demand management, service portfolio management, and business relationship management (Cannon et al. 2011) have the potential to integrate or interfaces with BM. Integrating BM within IT service management would ensure ongoing management and responsibilities. Additionally, adapting to changing dynamic environments could be possible.

Second, the influence of user engagement within software development (He and King 2008) and service engineering (Bullinger and Scheer 2006) could be extended within the usage phase of project results. Doing so could seek to bridge the gap between user engagement within projects and the lack of power to further develop project results while using it (Semmann and Böhmann 2015).

Third, research on BM should seek to relate recent trends within project management and IT delivery. As the still scarce use of BM in practice suggests, organizations have difficulties adding BM to well understood and experience-driven project management practice. Thus, if the aim of research on BM is affecting practice, it should be related to agile development methods (Corvera-Stimeling 2015; Goh et al. 2013; Hummel et al. 2015; Mahadevan et al. 2015) to introduce a benefit perspective while organizations start implementing agile methods, especially as IT development and IT operation evolve to continuous delivery (Ross et al. 2016). As this development gains broad application and extension, BM could focus on users to realize value. Thus, BM could contribute to shaping the novel concept of BizDevOps (Freedman 2016; Gruhn and Schäfer 2015; Sung et al. 2016) and by doing so, foster the realization of benefits.

Fourth, building on the state of practice depicted in this thesis (Semmann and Böhmann 2015), there is potential for further research that could lead to a BM toolset that could consider contextualization and value in use. This could be based on further investigating the approaches taken in practice. By analyzing these in-depth, insight on their instantiations, behavior in dynamic conditions and changing project staffing could be derived. This could lead to beneficial combinations of approaches and further refinement, resulting in a set of methods can be applied contextually and could complement each other.

8.3 Supplement Organizational Transformation by Internal Crowds

Sustaining organizational change is still a complex and difficult endeavor. As this thesis depicts, engaging employees within internal crowds has the potential to supplement organizational change. Accordingly, future research should further elaborate on this potential.

First, CESs could be broadened by leveraging training outcome by applying internal crowdsourcing as a concept that engages learners and sustains the application of learned content and methods. Thus, change in behavior could be sustained and ultimately could foster organizational change. This concept is also mirrored by supporting the transfer of training using IT without explicitly relating to organizational change (Semmann et al. 2014).

Second, more research on establishing and governing internal crowds is needed (Semmann and Grotherr 2017; Zuchowski et al. 2016). Especially, motivating employees to participate and retain engagement is crucial for internal crowds. Thus, integrating research on collaboration seems worthwhile to overcome this issue (Leimeister 2014; Leimeister et al. 2005; Leimeister et al. 2009; Troll et al. 2016; Ye et al. 2016). Other relevant facets of internal crowdsourcing that needs further elaboration are manifold. As of now, granularity of tasks and complexity of tasks need further consideration, as these aspects also influence engagement within the platform. Research should seek to investigate various levels of granularity and complexity to derive implications for effective tasks. Additionally, this could also relate to organizational culture. Adding this perspective could also support research on engineering internal crowds in terms of establishing and governing it. Doing so would also contribute to calls within the domain of open innovation for a better understanding of designing platforms that are aligned within an organizational ecosystem (Bogers et al. 2016).

9 Identifying Opportunities for Service Productivity Improvement Using a Business Model Lens – Lessons From Corporate Education Services

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Abstract

Identifying potential productivity improvements in highly co-created services is a challenge for practitioners and researchers alike. In our contribution, we focus on corporate education services that are designed and delivered in close collaboration between service providers and service customers. We demonstrate how adopting a business model lens facilitates the search for productivity improvements in this setting. In our discussion, we use a business model based approach to derive ideas for productivity improvement. Afterwards we derive implications for future research on improving the productivity of highly co-created services.

Keywords

Education, business models, productivity

9.1 Introduction

The German service sector is a key driver for the future development of economy and prosperity. Especially knowledge-based professions are suitable to ensure long-term domestic jobs. This increases the importance of lifelong learning and therefore also of the service education.

At the same time not even a third of the companies in Germany have tested the mediation of the targeted qualifications at the participants of education services and only around 25% have measured the impacts of education service goals on the project results. However, many companies would invest more money into education services if their success were measured for professional practice (DIHK, 2005). This underlines the specific needs of companies for new ways to detect and increase the value of education services.

Currently, the potential for cost savings through partly standardization of education modules and quality improvement through increased personalization are unexhausted (Gabriel et al. 2007). Hence, it is necessary to consider education services regarding their productivity. The productivity of these services is measured related to the utilization of input resources in a transformation process to co-create value with the customer (Grönroos & Ojasalo, 2004; Parasuraman, 2010). In comparison to productivity in good oriented companies, the customer has an enormous influence on the productivity of education services. Thus, it is necessary to take a more comprehensive point of view and not just to focus on internal activities. Therefore, the application of a business model perspective can be used. Business models offer a system-level holistic view on the business logic (Zott et al., 2010) and thus give the possibility to focus value creation in a comprehensive way. This leads to the following research question: What are possibilities for productivity improvement in highly co-created corporate education services according to the business model lens? In addition, we demonstrate how adopting a business model lens facilitates the search for productivity improvements in this setting.

Adopting the business model lens is consistent with traditional, production-oriented approaches of service productivity improvement. Among these are reduced heterogeneity through customer selection as well as improvements in processes, resource utilization, and the use of outsourcing. However, the business model lens also captures novel opportunities. Beyond these production-oriented productivity improvement ideas, however, the business model framework points to further approaches. These opportunities are transaction-oriented in the sense that they improve the initiation, agreement, monitoring, and consumption of a service. For corporate education

services, the business model framework helps to identify opportunities, through better alignment of incentives for education service consumption and a more efficient relationship management and sales of corporate education services. Given the high degree of co-creation present in these services, there is a fluent boundary between sales (e.g. pre-sales consulting) and service (e.g. chargeable design and implementation efforts). Adopting the business model lens provides a comprehensive view on potential service productivity improvements. From these findings derive implications for further research on business models and service productivity.

This contribution reports on an on-going collaborative research project in which we combine conceptual research with data collected from expert interviews among customers and providers of corporate education services. Therefore the paper starts with a brief summary of the conceptual foundations, followed by an overview of the methodological approach. This approach combines three steps to enable a holistic analysis process to identify productivity improvements and thus to facilitate a top-down approach for productivity improvement. The first step covers a structured investigation of the business model. This will be utilized to derive ideas for productivity improvement. Based on these general ideas specific possibilities for improvement are developed for a real life setting. The paper ends with a conclusion and an outlook for further research.

9.2 Conceptual Foundations

9.2.1 Corporate Education Services

Education relates to the process of learning and acquiring information. In every country an individual has various educational opportunities. The German education service landscape for adults consists mainly of private education service providers and public universities. The wbmonitor survey 2010 has captured a better overview of the types of providers in the German education service landscape. As in previous years, nearly half of the participants of the survey are private facilities (33% commercial, 15% common good), 14% are Volkshochschulen (German Community Education Center). Corporate and business-oriented institutions as well as large social organizations (churches, political parties, unions, organizations, associations, foundations) represent 12% each. Ten percent are allocated to vocational colleges and (specialized) universities and five percent to other types of providers. The deviations from 2009 do not exceed more than two percentage points (Ambos et al., 2010).

This contribution focuses in particular on corporate education services. But what is a service? Spohrer et al. describe a service system as "... a dynamic value co-creation configuration of resources, including people, organizations, shared information [...], and technology, all connected internally and externally to other service systems by value propositions." (Spohrer et al.,2008). Especially education services are characterized by a high degree of interactivity and, consequently, individuality. Finally, learning is an active process that stringently requires interpersonal interaction (Alavi et al., 2002). Corporate education service providers offer occupational training and further education services. In Germany, the market for these services has an estimated volume of 26.5 billion € (BMWI, 2008). In 2005, 69% of German companies offered education services (Statistisches Bundesamt, 2007).

Given demographic change, the development of the knowledge society and the rise of new technologies, demands on corporate education are likely to increase. The very same circumstances, however, require a change in how these services are designed and delivered to make the best use of increasingly limited qualified human resources in a quintessential people-based service. Not surprisingly, the research program MARS identifies education services to exhibit a high growth potential and at the same time is still in need for research (Pfeiffer & Kaiser, 2009).

Our research focuses on corporate education services with customized education solutions tailored to meet the specific needs of corporate clients and individual participants. Because of the deep integration of customers from design into delivery, approaches for improving service productivity are far from being obvious for these highly co-created services.

The process of creating an individual corporate education service (see Figure 8) was recorded at a field partner (see section 4). It starts with the initiation and the initiative comes either from the customer or provider. If the two parties agree on a fundamental concept, further meetings will be agreed. This fundamental concept is used in further processes as a contractual basis.

Figure 8. Status quo – processes of creating an individual corporate education service.

After a successful conclusion the design process will start and the concept will be worked out more detailed. Once the education service was recorded in a concept, the process realization will be performed. Meanwhile, all infrastructure elements are booked, class and eLearning lectures are held, knowledge transfer is promoted and an evaluation made by the participants is conducted. Last but not least, the corporate education service workflow ends with an evaluation through the customer and provider with the finalization process. In the next step, the evaluation results are summarized and used for the improvement of further iterations of the same education service.

9.2.2 Co-Creation

During the last decades the perspective of value creation turned from a value-in-exchange view where value for customers is embedded in products to a value-in-use view where value for customers is generated during the value-generating processes (Grönroos, 2008). This reflects the shift from a traditional goods-dominant logic with the focus on the exchange of goods to a service-dominant logic focusing on the creation of value (Vargo & Lusch, 2006).

According to this value is not created by buying products but by using them in a specific context (Gustafsson et al., 2011). This reflects renunciation from distinct roles of customers and producers towards a broad engagement of the customer in value creation (Prahalad & Ramaswamy, 2004).

This new perspective emphasizes on the understanding of the customer as part of the value-creation (Edvardsson et al., 2010; Spohrer et al., 2008). From this point of view the customers can tailor the product or service pursuant to their needs, which results in an enhanced value creation (Kristensson et al., 2008). Furthermore this leads to a closer relationship between the customer and the service provider, because the customer is committed through the complete process of value creation (Babb & Keith, 2011; Jaworski & Kohli, 2006). This also implies that customers can be part of the value creation along the complete value creating activities e.g. from the development to the delivery of a product or service by providing customer-specific knowledge (Gustafsson et al., 2011). Another aspect of co-creation is that customers are expected to be more satisfied with the tailored services, since they actively participate in the creational processes (Randall et al., 2011).

In the area of corporate education services the concept of co-creation is highly relevant, because the degree of involvement of the customer is high. This deep integration is necessary to ensure that the service meets the level of knowledge of the participants as well as the specific needs of the customer. Such highly customized services can only be developed if the customer is part of the development processes and shares his knowledge and resources with the service provider. Furthermore, co-creation can be seen during the realization of the program because it is influenced by the participants' behaviour and the dynamics between the members of the group.

9.2.3 Service Productivity

The productivity of a service is a measure related to the utilization of input resources in a transformation process to create value in cooperation with the customer (Grönroos & Ojasalo, 2004; Parasuraman, 2010). In spite of the high relevance of productivity improvements in the service sector, there is currently no universal understanding of service productivity (Baumgärtner & Bienzeisler, 2006).

Traditional, goods-dominant productivity concepts assume that an increased productivity can be achieved by minimizing the inputs with constant outputs and a given quality. These concepts are not applicable to services, because on the one hand, the definition of a single service unit is not trivial. On the other hand, the assumption of a given quality is not applicable for services, because a variation of input factors leads to a changed perceived quality (Grönroos & Ojasalo, 2004). To face these shortcomings Grönroos and Ojasalo (2004) suggest a service productivity model based on three elements:

(1) Internal efficiency: Describes the efficiency of the transformation of inputs to outputs, resulting in services.

(2) External efficiency: Describes the perceived quality of the service.

(3) Capacity efficiency: Describes the efficiency of the utilization of the service provider's capacity.

The remainder is based on this understanding of service productivity.

9.2.4 Business Models

As already shown, service productivity focuses on the transformation of used resources to economic results for the service provider and its customer (Grönroos & Ojasalo, 2004; Parasuraman, 2010). By limiting the target onto the transformation process, important ideas for productivity improvement maybe missed. With the help of business models it is possible to extend the view from a resource focussing perspective to a wide holistic one on the complete business logic (Zott et al., 2010). This enables us to take the value proposition into account, which contains the main characteristic of the service and its delivery. Moreover with business models, the contemplation of co-creation is possible, which is a key characteristic of services. At last a business model can help to visualize the links between separate business model elements and thus the dependencies within the business logic.

In order to utilize the business model for the analysis of the opportunities for productivity improvement in education services it is necessary to define the term "business model" first. This step is very important because a huge variety of literature reviews show manifold understandings in research (Al-Debei, 2010; Osterwalder, 2004; Zolnowski & Böhmann, 2011). A selection of different definitions and conceptualizations of the business model concept can be found i.a. at (Afuah & Tucci 2001; Al-Debei, 2010; Ethiraj et al., 2000; Slywotzky & Morrison, 1998; Timmers, 1998; Wirtz, 2001; Zott & Amit, 2007).

Based on a literature review Al-Debai (2010) summarizes a business model as "[...] an abstract representation of an organization, be it conceptual, textual, and/or graphical, of all core interrelated architectural, co-operational, and financial arrangements designed and developed by an organization, as well as all core products and/or services the organization offers based on these arrangements that are needed to achieve its strategic goals and objectives." (Al-Debai, 2010). Similarly Osterwalder (2004) defines a business model as a "[...] conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams." (Osterwalder, 2004). Osterwalder and Pigneur (2010) also developed the business model canvas, which represents a visualization of the business model dimensions. Because of the systematic and easy use of the canvas, we selected this approach for the analysis of the considered education services.

Osterwalder (2004) posits that a business model can help to describe and to understand an underlying business logic so that we can analyze the business model of education services based on the structure provided by the nine dimensions of this model. These are value propositions, customer segments, channels, customer relationships, key activities, key resources, key partners, cost structure and revenue streams (Osterwalder & Pigneur, 2010).

Value proposition provides an overall description of a product or service. It contains a detailed description of the product and the value it can deliver to the customer. Customer segment contains a specification of the target customer segment and, if possible, further information about the client needs. Distribution channel describes the way a customer is reached by the company and how effectively this channel can be used. Combining this dimension with customer relationship makes it possible to look at how the customer is reached and what type of relationship the company has with the customer. Key activities in interaction with key resources describe all activities and resources needed to realize the offer. If any activities cannot be executed or resources are not available key partners are needed. They provide activities or supply resources that are required to render the service or product. The cost structure offers a list of the most important and most expansive cost positions. The last dimension in the Osterwalder model is revenue stream, which gives an overview of possible revenue streams (Osterwalder & Pigneur, 2010).

9.3 Data Collection and Analysis

This research is based on conceptual research with data collected from expert interviews among customers and providers of corporate education services. The interviews focus on the internal processes of education service providers.

The first experts of the field partner were interviewed during a workshop. Through a brainstorming session with experts we were able to answer questions regarding in-put, output and process success factors in education services. This mentioned success factors were categorized by the participating actors in the process of co-production. The questions were derived from the productivity model of Bitzer et al. and the output factors of Kirkpatrick (Bitzer et al., 2010; Kirkpatrick & Kirkpatrick, 2006). Therefore, open questions were asked about the output success factors, input success factors of the customers and participants, input success factors of the provider and process success factors. Based on this approach we developed a first common understanding of success factors for education services.

Up next we conducted an interview with an expert of the field partner. During the interview we modelled a coarse-grained process. Subsequent to the interview a useful list of questions that could be used in future interviews was generated. The list of questions was structured according to the coarse-grained process and includes the following questions:

- How does the workflow work?
- Which actors are involved?
- What documents are created or used?
- What results can be expected?
- Will the results lead to an improvement process?
- Which supporting tools are used?
- What is the effort for each workflow?

Up to then, a list of questions was applied in four other expert interviews and could be optimized. Through further interviews we defined with experts the process flow and corresponding expenses.

A second workshop with selected project managers from the field partner aimed at output success factors and their measured variables. The mentioned output success factors were taken from the results of the first workshop. By the second workshop the understanding of the education service outputs were sharpened. A further opportunity was the way of measuring the outputs that could be identified. The methods used to measure output were also derived and assessed by the experts of the field partner. Finally through this workshop, we were able to provide a basis for assessing the project's success that could be established.

Based on the collected information a business model was derived, which was the starting point for the next expert workshop. At this workshop the business model was considered element by element, in order to identify ideas for improving productivity.

9.4 Opportunities for Productivity Improvement

9.4.1 The Business Model

In the section below the derived business model, based on the conducted interviews, is introduced. Figure 9 shows the complete business model:

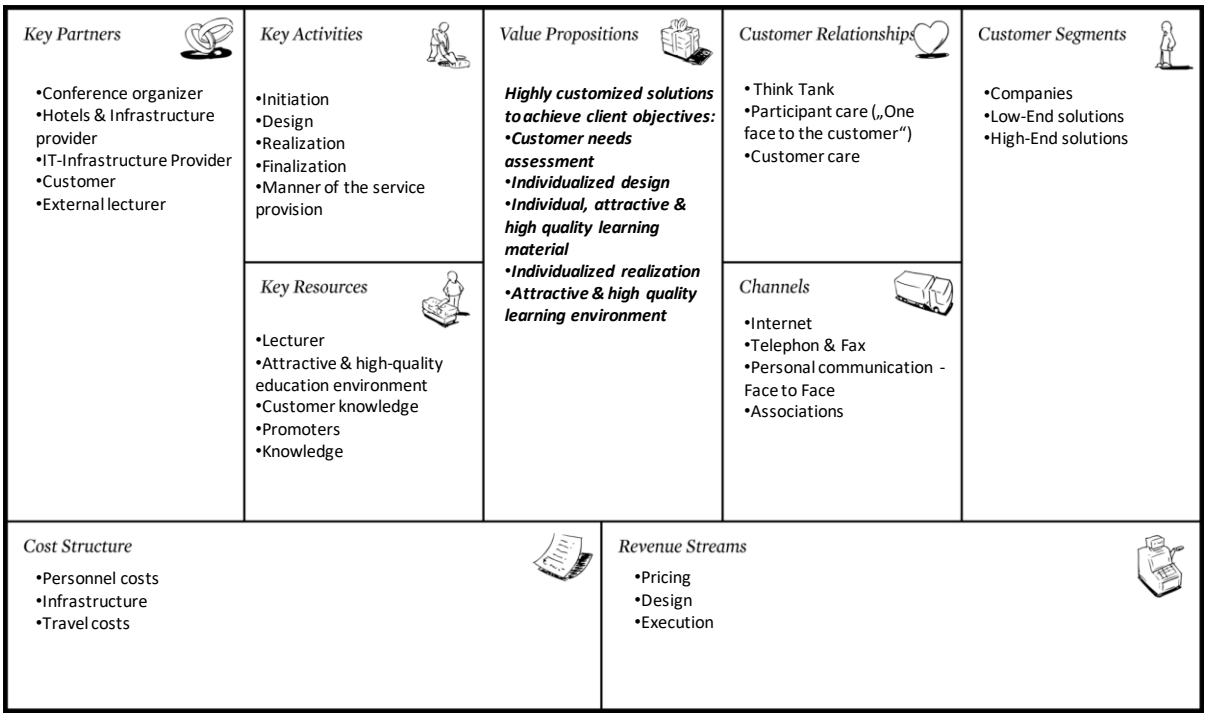

Figure 9. Derived business model of corporate education services

The business model of the considered case focuses on corporate education services. Therefore, the **customer segment** is limited to the companies and their employees. In contrast to the limited customer segment, the attendees can vary on their position and skill level. Depending on the requirements of the customer it is possible to perform simple courses as well as high performance courses for executive employees.

The focus on corporate education services has a strong influence on the **value proposition**. Customization and thus an individual adaption of the whole program is necessary to achieve the clients objectives. In order to reach this goal it is necessary to integrate the customer into the whole process. Thus, corporate education services are a highly co-created service. The co-creation permeates the entire process beginning by an individual needs assessment, via an individual design, up to an individualized realization. Of course, the designed materials need to be

individual, attractive and of high quality. Beyond the actual service provision, however, there are other important characteristics for a successful realization. In particular, the conditions and environment play an important role.

The **relationship** to the customer is based on the think tank concept. This means that the provider has an enormous knowledge advantage at a special topic and thus the possibility to create value for the customer. This value has to be translated with the help of the corporate education in market advantages for the customer company. Because of the highly individualized service characteristics, the contact is personal and mostly managed by a key account, which represents an exclusive connection between provider and customer. This also means that existing customers are very important and will be cared by a dedicated customer care.

The corporate education service provider uses several **channels** to get in contact with the customer. Of course, one very flexible channel is based on the Internet. One first contact point is represented by the website of the provider, which contains general information about the knowledge of the provider and a login area for special material. The second, and most important, channel is the e-mail. Moreover, social media can be used to distribute information to all customers. Last e-conferences are used to get in touch with customers and attendees. Beside the indirect communication channel over the Internet, using the telephone is a direct and important channel through landline, mobile phone or fax. Another possibility is the personal communication (face-to-face) between provider and customer. Associations represent the last identified channel.

First we consider the interface to the customer, and then we change the perspective onto the service creation. The identified **activities** describe the essential steps in the service creation and provision. The initiation phase starts with a concrete program idea and the need for an educational service. After the contract is signed, the design phase starts. It includes the design of the education service and ends in the realization where the service will be provided. The activities stream ends with the finalization of the contract.

The most important **resource** for an education provider is the knowledge. It is the enabling key for the offer and absolutely necessary for the realization of any education program. To transfer this knowledge lecturers are needed. Depending on the needs of the customer internal or external experts can be used. Beside the human resources an attractive and high quality education

environment should be available. Nevertheless, to obtain a successful realization we have to implement resources of the customer and thus the co-creation. The knowledge of the customer represents one of the most important co-creation elements. Moreover, promoters on the customer side can help to realize successfully the education service.

To perform the described activities and to get the required resources, often **partners** are needed. The most important partner is the customer itself. In the highly co-created education service the customer has to share his knowledge and to provide other resources. Further, external lecturers are needed who provide special knowledge and resources. Moreover, infrastructure providers are needed to provide e.g. locations, technology and special equipment. There might be a need of a promotion conference organizer.

One part of the financial fundament of a business model is the **cost structure**. Staff costs represent the biggest cost element. This includes the costs of its own staff and of the possible external lecturers. Another cost element is the infrastructure and its maintenance. Last, travel costs can pose a major factor.

Not to be forgotten the **revenue streams** are an important element of the business model. The main revenue sources can be found in the design and realization phase of the education service process. During the initiation and finalization phase no revenues are made.

9.4.2 Productivity Improvements

In the following section we derive potential ideas for productivity improvements from the described business model. The ideas are derived from a conducted expert workshop where the identified business model elements were discussed.

According to the description of the business model the first focussed area is the customer segment. The first identified factor is the customer company itself. These companies can be clustered according to size or industries, which lead to a productivity improvement idea concerning a focus of the provider to special clusters with individual characteristics. With this specialization it is possible to enhance the internal efficiency of the company, because i.e. processes of the target customers are similar and therefore an adjustment to different customers is less complex.

Furthermore, this block can be differentiated between rather simple low-end solutions and complex high-end solutions. Both types can be seen as ideas for productivity improvement. Low-end solutions have different variables that can improve the overall productivity. One productivity improvement idea is the utilization of standardized knowledge and learning materials for these services, because it is possible to use the necessary knowledge once respectively find an adequate external lecturer once. In case of the teaching material it is possible to design these once and reuse it when necessary. This leads to an improvement over time and if the degree of reusable materials and standardized knowledge is high in services the productivity can be improved.

Another productivity improvement idea is the design of a complete corporate education program. This can be utilized by the individual composition of learning modules and methods of the transfer of knowledge. With a high modularization of contents it is possible to shorten the design process of a corporate education service, which leads to a higher internal productivity. Furthermore it could lead to a higher external efficiency, because the utilized material is well tested.

The last identified productivity improvement idea in the context of low-end services is the group size. In these highly standardized programs it is possible to have a higher number of participants, because the effort decreases for every additional participant and therefore enhances the capacity efficiency of the service provider.

The scenario of high-end corporate education services is characterized by extensive individualization. For this reason, it can be necessary to search for every individualized service for an adequate lecturer that implies high inputs for a given output. This is a high effort and thus represents a strong idea for productivity improvement. Just as low-end services the learning material is another idea for productivity improvement, because the modularized materials enable the provider to reuse content und nevertheless have extensively individualized services. According to this, modularization is also an approach for productivity improvement in the design process. Following this argumentation the potential improvement of productivity is much higher than in low-end scenarios.

Another idea is the possible consideration of every single participant of a corporate education service. At first sight this leads to a higher effort during the design and realisation of the service,

but this high degree of individualization results in a higher benefit for the customer and hence strongly influences the external efficiency. The last generated idea is the size of the learning groups. In high-end scenarios the group size is smaller than in low-end scenarios. This leads to an individualized realization of the service and according to this the benefit for the participants is higher. All the identified productivity improvement ideas are summarized in table 16.

Table 16. Productivity improvement ideas for the customer segment

Customer segment	
Business model elements	**Productivity improvement ideas**
Companies	Companies as customers clustered according to size or industries
Low-end solutions	Standard knowledge and learning material Individual composition of learning modules and knowledge transfer methods Larger groups
High-end solution	Comprehensive individualization of Knowledge and -material Individual composition of learning modules and knowledge transfer methods Consideration of the individual participant Smaller groups

In the area of value proposition the ideas for productivity improvement can be divided into five categories. The first category is the assessment of the individual needs of the customers. The type of assessment can be seen as an improvement, because there is a difference between a personal face-to-face setting and an assessment wire telephone or e-mail. Another idea in this category is the utilization of standardized assessments using a predefined grid compared with a highly individualised interview-based assessment. The selection of an optimal method for the customer can improve the productivity, because it can be more efficient to have a grid-based assessment with a higher number of interviewed customers and in another scenario individualized interviews can be optimal. With this idea it is possible to improve the internal productivity of the customer as well as the service provider´s.

The second category of productivity improvements is the individualized design of a corporate education service. An idea in this category can be the consideration of the customer respectively single participants in the design phase to ensure the satisfaction of the customers needs and improve the external productivity. Furthermore the use of workshops to identify the customers´ needs can lead to productivity improvement, because a strong alignment of the corporate education service to the needs and expectations results in a better benefit for the customer and less

iterations during the evaluation of the concept by the customer, which highly improves the internal and external efficiency.

An idea for productivity improvement in the category learning materials is the degree of individualization of appealing materials. In this context a possible improvement can be seen in the degree of reusability and customization of these documents in contrast to a complete customer-specific design.

The fourth identified category is the individualized realization of a corporate education service. An idea in this category is the group size, mentioned before in the customer segment. Another idea is the location where the corporate education service takes place. The bandwidth ranges from in-house setting at the customers offices to hotels or conference centres and the providers offices. This idea influences the internal efficiency as well as the external. For this idea a balance has to be found where the internal and external efficiencies do not compensate their effects reciprocally. Furthermore, the use of media can lead to productivity improvement. Possible scenarios are totally computer-based eLearning environments as one extreme and face-to-face scenarios as the opposite. In between are blended learning scenarios with different degrees of computer-based elements. This idea can influence the productivity to the effect that travel time can be reduced and the realization is more flexible. Therefore input factors can be reduced and the internal efficiency rises.

An additional possibility for improvement is the lecturer. In this context it is possible to engage a generalist or specialists for the corporate education service. A generalist enables the customers to dynamically adapt the focus of a service to different aspects of the programs theme, but a specialist is able to give deeper insights into the theme. This idea can improve the productivity, if the selection of the lecturer is made under consideration of the expectations and needs of the customer.

The next derived productivity improvement idea is the administration for the program. This includes services like the booking of hotels, provision of social events and catering. These services can improve the customer experience of a corporate education service and for that reason improve the external productivity.

The last identified category is the learning environment. It includes the location as a possibility for improvement with the different previously described scenarios. Furthermore, the equipment

of the location can lead to improvement, because an adequate equipped location enables a better customer experience and perceived quality of the service. An overview of the derived ideas is given in table 17.

Table 17. Productivity improvement ideas for value proposition

Value proposition	
Business model elements	**Productivity improvement ideas**
Customer needs assessment	Type (e.g. face-to-face vs. telephone interviews) Degree of standardization (grid-based vs. Individualized assessment)
Individualized design	Degree of consideration of the customer Workshop(s) during the design process or none (effect on potential additional acceptances)
Individual, attractive learning material	Standardized material vs. individualized material vs. new developed material
Individualized realization	Larger groups vs. smaller groups Location (Providers´ office vs. Hotel/Conference center vs. In-house) Use of media (blended learning vs. eLearning vs. face-to-face) Generalist vs. specialist Administration (e.g. booking of infrastructure, social events, catering)
Attractive / high quality learning environment	Location (Providers´ office vs. Hotel/Conference center vs. In-house) Equipment (e.g. Laptop, Beamer, Flipchart, furniture in general)

According to the customer relationship one idea can be summarized as participant care. This includes the type of contact to the customer. In this case it can be differentiated between dedicated contact persons for customers where the perceived service quality is better than in case of unknown contact persons. The influence on the productivity can be seen in the more intense relation in case of specific dedicated contact persons that lead to a better and faster understanding of the customer´s needs on the one hand and the less time spent dealing with customers in a personal care scenario without specific dedicated contact persons on the other hand. According to this another idea can be seen in specific addressing customer. A direct address of a single person can be more effective but also time intense compared to a faster but potentially less effective address of groups of customers. Following the individual needs of the customer the type of personal care has to be adjusted and depending on the choices made the internal and external efficiency can be improved.

Another idea for productivity improvement is the customer care. Analogous to the participant care it can be differentiated between dedicated specific and unspecific contact persons for customers. Furthermore, the availability of channels for the customer care can be an idea for

productivity improvements, because the mix of channels and the use of digital communication can reduce the time consumption for incidents and thus improve the productivity. All these ideas are summarized in table 18.

Table 18. Productivity improvement ideas for customer relationship

Customer relationships	
Business model elements	**Productivity improvement ideas**
Participant care	Dedicated contact persons vs. unknown contact persons Direct address of a single person vs. groups of customers
Customer care	Channels for customer care Dedicated contact persons vs. unknown contact persons

The channels used by the corporate education service provider can influence the overall productivity. In this area one idea can be the use of the Internet. There are different ways to utilize this channel. On the one hand, there are commodities like hosting a website that can reduce the amount of paper-based marketing or e-mail, which can reduce the response time. On the other hand, state-of-the-art features like social media and e-conferences can significantly increase the participation of the customer, which leads to a higher engagement and therefore a closer relationship.

Other ideas are the use of telephony and fax as well as direct personal communication in face-to-face settings. All these different channels can be seen as possibilities for higher productivity if a mix of them meets the needs of the customer. For this reason it is necessary to develop a deep understanding of the customer needs to ensure the use of an optimal mix of channels to provide a high internal and external efficiency.

The last generated idea is the membership and participation in associations. With such an engagement it is possible to identify potential future needs of customers and to enable the provider to be prepared for their requests. The developed ideas are summarized in table 19.

Table 19. Productivity improvement ideas for the channels

Channels	
Business model elements	**Productivity improvement ideas**
Internet	Reduce efforts through website, e-mail, social media, e-conference Commodity vs. rest
Telephone / Fax	Mix has to meet the needs of the customer
Personal communication - Face to Face	Mix has to meet the needs of the customer
Associations	identify potential future needs of customers

The area of key activities can be addressed along an abstract process flow. In the first phase the initiation of an education program takes place. An idea derived by the conducted interviews and workshops is the assessment of customer needs that is described previously within the value proposition. The next phase is the design of the program according to the customer needs where a choice between standardization and individualization has to be done. More aspects at the design phase were already discussed in the value proposition. Following this, the implementation phase begins. Analogous to the design phase, a choice between standardization and individualization will be done a second time. As third step in the provision of an education service, the realization phase can be identified. One idea in this phase is the choice between standardization and individualization. Other possibilities for improvement can be found at the value proposition within the individualized realization. At last an idea was found, which covers an overarching decision about the manner of the service provision. The finalization, as last phase of the service provision, does not provide possibilities for productivity improvement. An overview of the productivity improvement ideas is given in table 20.

Table 20. Productivity improvement ideas for key activities

Key activities	
Business model elements	**Productivity improvement ideas**
Initiation	See value proposition → customer needs assessment
Design	Standardization vs. individualization See value proposition → individualized design and materials
Realization	Standardization vs. individualization See value proposition → individualized realization
Manner of the service provision	Blended learning vs. eLearning vs. Presence learning

Internal lecturers know the processes and customers of the corporate education service provider better than external lecturers. Thus, internal lecturers can adjust them-self better to the individual customer and have a higher influence on internal processes of the corporate education service provider.

Both internal and external lecturers can be generalist or specialist. The main difference between these two types is the breadth and depth of expertise of the lecturer. Generalists can perform a wide range of education services, but provide no in-depth knowledge. Unlike the experts, they can perform a much lower number of education services and mediate in-depth knowledge. These features suggest that education service provider have an advantage if their internal lecturers are generalists.

However, also by the particular infrastructure of the corporate education service provider, the productivity can be affected. This creates through appreciation of the participant and a general well being of the employee a pleasant atmosphere.

In education services it is sometimes necessary that customers have to share their knowledge with the provider, such as internal processes. If the provider can use the knowledge of the customer, the lecturer must not acquire the corresponding knowledge. Also, definitions of terms are the same, so that participants understand the education service. In certain cases it could be that processes must be analysed. If the customer is able to deploy this analysis to the education service provider, the provider will not be in charge.

If an education service provider has a promoter, the analysis of the needs of the customer is carried out better and more efficient. The respective result is better through the promoter and the customer gets exactly what corresponds to his expectations. The mentioned ideas may ultimately mean an increase in productivity at the corporate education service provider. An overview of all ideas is given in table 21.

Table 21. Productivity improvement ideas for key resources

Key resources	
Business model elements	**Productivity improvement ideas**
Lecturer	Internal vs. external lecturer Generalist vs. expert
Attractive & high-quality education environment	See value proposition
Customer knowledge	Integrate vs. not integrate
Promoters	Integrate vs. not integrate

The area of key partners includes a broad variety of possibilities for productivity improvements. These ideas can be addressed with a binary decision about the use of external service providers such as professional conference organisers, hotels and infrastructure providers in general as well as IT-infrastructure providers. If it comes to a decision in favour of an external service provider one can assume that the invested money is at least equivalent to the cost of an in-house realization or the quality of the realization is better. This results in a raised internal productivity.

Another idea is the degree of customer involvement. With this variable an optimal involvement for each customer can be achieved. The ideal degree cannot be given in general, because the specific needs of the customer determine this degree. So in one case it could be better to highly integrate the customer to ensure that the provided service fits totally to the goals but in another case a lower degree of involvement could be more efficient.

The last identified idea in the area of key partners is the employment of external lecturers. In general it is more efficient to employ a specific external lecturers regularly, because they know the provider and the methods of the design processes of a highly customized corporate education service, which differs from out-of-the-shelf solutions without adaptations. For that reason the selection of lecturers is an important variable for the internal productivity of a service provider. An overview of the productivity improvement ideas is given in table 22.

Table 22. Productivity improvement ideas for key partners

Key partners	
Business model elements	**Productivity improvement ideas**
Conference organizer	Integrate vs. not integrate
Hotels / Infrastructure provider	Integrate vs. not integrate
IT-Infrastructure Provider	Integrate vs. not integrate
Customer	Degree of involvement
External lecturer	more efficient to employ regularly, because they know the provider and the methods of the design processes

While deriving the business model in the cost structure no ideas for productivity improvement were identified, because the monetary input of a service does not encompass possibilities to improve the productivity.

Table 23. Productivity improvement ideas for the cost structure

Cost structure	
Business model elements	**Productivity improvement ideas**
None	-

In contrast to the cost structure in the context of revenue streams a possibility for productivity improvements can be found. This idea is the pricing of a service. With a variation of the price it is possible to optimize the number of customers and therefore the capacity efficiency. For example with discounts for groups it is possible to ensure that the maximum number of participants is reached which leads to the optimal utilization of the infrastructure and staff. The idea is given in table 24

Table 24. Productivity improvement ideas for the revenue stream

Revenue stream	
Business model elements	**Productivity improvement ideas**
Pricing	Variation of the price to optimize the number of customers

9.5 Conclusion and Outlook

This contribution shows that the use of the business model lens is an adequate method for a holistic analysis of existing services. The big picture developed explains the underlying business logic and so the most important elements for the service provision. Thus, it is possible to generate main ideas for productivity improvements in the business model that are relevant for

scholars to deal with productivity in this domain as well as for practitioners to understand possibilities to improve productivity of corporate education programs.

The analysis of the conducted workshops as well as the expert interviews give an inside into the business model of corporate education service providers, which represent a highly co-created service, designed and delivered in close collaboration be-tween service providers and service customers. In this case we were able to discuss the first two steps of the previously described approach and thus to identify different ideas, which have an extensive influence on the productivity of the service provider. Overall, these ideas can be clustered in four categories: 1. Standardization of the corporate education service, 2. Modularization of the content, 3. Environment with direct influence on the service proposition 4. Environmental factors with indirect influence on the service provision.

(1) Standardization: This cluster subsumes potential productivity enhancements based on the degree of standardization of services. The range of standardization outreaches from a high degree without customer-specific individualization to completely individualized services. Within this range an increased degree of standardization leads to potentially improved productivity.

(2) Modularization: This cluster deals with the structure of corporate education programs. The effect on productivity can be reached by a modular design of the services and thereby the possibility to a flexible composition of these modules and the reuse of them.

(3) Environment with direct influence on the service provision: This cluster aggregates factors that affect the learning process directly like learning materials or the group size. Furthermore, it influences the perceived quality of the services and therefore has an effect on the productivity.

(4) Environment with indirect influence on the service provision: This cluster subsumes factors that indirectly affect the service like the location or the administrative factors as the booking of hotels and the provision of social events.

Based on the results of the second step, it is necessary to transfer them to a real life setting. This will be done by conducting a further expert workshop and interviews. Overall, this paper is the initial point for further research in the area of corporate education services and the improvement

of their productivity. The derived ideas have to be evaluated with the field partner. Furthermore, the application of the introduced approach has to be verified in different settings in the field of corporate education services to prove its applicability.

The derived results are subject to limitation, because the field partner is specialized in individualized corporate education programs and therefore the results have to be evaluated in different settings. But at the current stage of research the identified ideas seem to be promising to help the management of corporate education programs to improve the productivity. Another limitation is the utilized business model by Osterwalder, which does not consider the specific needs of services (Zolnowski & Böhmann, 2011).

9.6 References

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10 Analysis of Learning Management Systems According to a Holistic View on Corporate Education Services

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Abstract

According to the still growing importance of services and especially knowledge-based services the importance of lifelong learning increases, too. In these premises the European Union targeted a rate of workforce participating in lifelong learning to at least 15 %, the current value is 9,3 %. The main impulse for current participants in an ongoing learning process is to improve career opportunities and to perform better in their jobs. Keeping these changes in mind, corporate education services are a good example of knowledge-based services. First of all, these services integrate the customer in depth to identify their specific needs and to deliver the service. Therefore, they can be seen as a good example of services following a service-dominant logic. Secondly, this sector gains on importance due to the economic as well as the demographic changes. Thirdly, corporate education services bear potential for economic growth. In 2008 market had a volume of 26,5 billion Euro in Germany. With the aspired increase in lifelong learning there is still potential to increase this number. Therefore this paper examines the potentials of current learning management systems to support corporate education services from a holistic perspective based on Kirkpatricks Four-Level Model. Based on this analysis potentials for further improvements of the support of the learning process are derived.

Keywords

service service productivity corporate education learning management system

10.1 Introduction

According to the still growing relevance of services and especially knowledge-based services, the importance of lifelong learning increases. Under this circumstance the European Union targeted a raise of the rate of workforce participating in lifelong learning from currently 9,3% to at least 15 % (Eurostat 2011). The main impulse for current participants in an ongoing learning process is to improve career opportunities and to perform better in their jobs.

Keeping these changes in mind, corporate education services are a good example of knowledge-based services (Vargo and Lusch 2004). First of all, these services integrate the customer in depth to identify their specific needs and to deliver the service. Therefore, they can be seen as a good example of services following a service-dominant logic, especially the co-creation is extensively considered (Vargo and Lusch 2004). Secondly, this sector gains on importance due to the economic as well as the demographic changes (Eurostat 2011). Thirdly, corporate education services bear potential for economic growth. In 2008 market had a volume of 26,5 billion € in Germany (Pfeiffer and Kaiser 2008). With the aspired increase in lifelong learning there is still potential to increase this number. To deal with this prospected growth it is necessary to enhance the productivity of corporate education services, because i.e. potential improvements of service quality are currently not exhausted (Gabriel et al. 2007). Especially the role of IS in this context is not clear. This leads to the following research question: *What is the influence of learning management systems on service productivity?*

To answer this question we introduce in the following section the theoretical foundations in the next chapter. After that, we analyze the state-of-the-art of learning management systems and show which function they have. As a next step we analyse the possibilities recent learning management systems provide to support a holistic von on corporate education, based on requirements derived from Kirkpatrick´s Four-Level Model (Kirkpatrick 1966). This mapping leads to a deep understanding of the possibilities to utilize current learning management systems and shows which aspects of the delivery of corporate education services are not addressed. Based on these findings we show how the quality of corporate education services can be increased by extending learning management systems. Finally we draw a conclusion and give an outlook on further research.

10.2 Theoretical Foundations

10.2.1 Productivity of Services

Traditionally productivity is a measure related to the utilization of input resources in a transformation process to create a product (Vargo and Lusch 2004). In the case of services this measure describes the same relation with a value as output, which is created in cooperation with the customer (Grönroos and Ojasalo 2004; Parasuraman 2010). In spite of the high relevance of productivity improvements in the service sector, there is currently no accepted understanding of service productivity (Baumgärtner and Bienzeisler 2006).

Therefore, following a goods-dominant logic productivity concepts assume that an increased productivity can be achieved by minimizing the inputs with constant outputs and a given quality. These concepts are not applicable to services, because on the one hand, the definition of a single service unit is not trivial and on the other hand, the assumption of a given quality is not applicable for services, because a variation of input factors leads to a changed perceived quality for the customer (Grönroos and Ojasalo 2004). To face these shortcomings Grönroos and Ojasalo (2004) suggest a service productivity model based on three types of efficiency:

1. Internal efficiency: Describes the efficiency of the transformation of inputs to out-puts, resulting in services.

2. External efficiency: Describes the perceived quality of the service.

3. Capacity efficiency: Describes the efficiency of the utilization of the service provider´s capacity.

In the remainder of this paper we understand service productivity analogously to Grönroos and Ojasalo (2004).

10.2.2 Corporate Education Services

Education relates to the process of learning and acquiring information. In every country an individual has various educational opportunities. The German education service landscape for adults consists mainly of private education service providers and public universities. The wbmonitor survey has captured an overview of the types of providers in the German education

service landscape (Ambos et al. 2010). As in previous years, nearly half of the participants of the survey are private facilities (33% commercial, 15% common good), 14% are community education center. Corporate and business-oriented institutions as well as large social organizations represent 12% each. Ten percent are allocated to vocational colleges and specialized universities and five percent to other types of providers. The deviations from 2009 do not exceed more than two percentage points. (Ambos et al. 2010)

Corporate education services can be characterized by a high degree of interactivity and, consequently, individuality. Finally, learning is an active process that stringently requires interpersonal interaction (Alaviet al. 2002). Corporate education service providers offer occupational training and further education services. In Germany, the market for these services has an estimated volume of 26.5 billion € (Pfeiffer and Kaiser 2008). In 2005, 69% of German companies offered education services (Destatis 2007).

Given demographic change, the development of the knowledge society and the rise of new technologies, demands on corporate education are likely to increase. The very same circumstances, however, require a change in how these services are designed and delivered to make the best use of increasingly limited qualified human resources in a quintessential people-based service. According to this, education services have a high growth potential and at the same time there is still need for research (Pfeiffer and Kaiser 2009).

To describe and evaluate corporate education services Kirkpatrick introduced a Four-Level Model, which is still accepted und utilized by scholars as well as in practice (Kirkpatrick 1996; Salas and Cannon-Bowers 2001; Van Buren and Erskine 2002). This model can be used to control the effect of corporate education services. This is done on the following four levels (Kirkpatrick 1996):

1. Reaction: On this level the focus is on the participant and their subjective valuation of the service. Aspects that should be considered on this level are the satisfaction with the trainer, the content of the service, the use of media and the infrastructure in terms of i.e. learning facilities and social program.

2. Learning: This level is utilized to measure the success of the corporate education service. It can be done by addressing the acquisition of knowledge, the improvement of skills, and changes in the attitude of the participants.

3. Behavior: Changes in the participant's behavior on their jobs are considered on this level. This means the transfer of the acquired knowledge towards real-life situations in the corporate environment. Therefore this level is the first where the assigning customer – the corporation – can benefit in terms of business value from the education service, because i.e. the customers customer can be better supported or new job profiles can be staffed with trained employees.

4. Results: This level represents indirect effects on the customer's business value. This could include higher sales, increased productivity, and reduced costs.

Based on these four levels requirements for the support of each of them can be derived to identify aspects that have to be addressed by any kind of supporting information systems. These are alike to the high level of abstraction Kirkpatrick used also abstract and the operationalization of these can differ according to the analyzed information system. The derived requirements are shown in table 25.

Table 25. Requirements of the Four-Level Model (based on Wang and Wang 2005)

	Requirements
Reaction (L1)	Providing learning materials Supporting communication of the participants Providing accommodation and other prevailing circumstances
Learning (L2)	Supporting the learning process
Behavior (L3)	Supporting the transfer of knowledge to the job
Result (L4)	Aligning the educational service with its intended goals

10.2.3 Co-Creation

According to the relevance of a deep integration of the customer in corporate education services it is necessary to introduce the concept of co-creation as a mayor part of the service dominant logic (Vargo and Lusch 2006).

During the last decades the perspective of value creation turned dramatically from a value-in-exchange view where value for customers is embedded in products to a value-in-use view where value for customers is generated during the value-generating processes can be identified (Grönroos 2008). This shows the new understanding of value as a result of a creation process of a

service provider together with the customer (Vargo and Lusch 2006). This change in perspective is characterized by Vargo and Lusch (2011; 2012) with four core premises. One of them is the integration of the customer in the service. In this paper we focus on this aspect of the service-dominant logic as one of it´s major shifts that is especially relevant for corporate education services that are customer-centric.

Following this shift value is not created by purchasing a product but by using it in a specific context (Gustafsson et al. 2011). This reflects renunciation from distinct roles of customers and producers towards a broad engagement of the customer in value creation as it is typical in the education service domain (Prahalad and Ramaswamy 2004).

This new perspective emphasizes on the understanding of the customer as substantial part of the value-creation (Edvardsson et al. 2010; Spohrer et al. 2008). From this perspective the customer is able to tailor the product or service pursuant to their needs, which results in an enhanced perceived value (Kristensson et al. 2008). Furthermore it leads to a closer relationship between the customer and the service provider, because the customer is committed through the complete process of value creation (Jaworski and Kohli 2006; Babb and Keith 2011). This also implies that the customer can be part of the value creation along the value creating activities e.g. by providing customer-specific knowledge to a service (Gustafsson et al. 2011). Another aspect of co-creation is that customers are expected to be more satisfied with the services, since they actively participate in the value creation (Randall et al. 2011). In the domain of corporate education services the involvement of the customer, understood as the participant as well as the contracting entity, is high, because the service is tailored towards the specific needs of the corporation. This deep integration is necessary to ensure that the service meets the level of knowledge of the participants as well as the specific needs of the customer. Such highly customized services can only be developed if the customer is part of the development processes and shares his knowledge and resources with the service provider. Furthermore, co-creation can be seen during the delivery of the service because it is influenced by the participants' behavior and the dynamics between the members of the group.

10.3 Methodology

To understand the impact of learning management systems on the productivity of corporate education services it is necessary to identify how each function of the system influences the

learning process. This is done by an analysis of current literature, scholarly as well as practitioner-driven, on learning management services and their functions. In a second step we compared these functions with requirements derived from Kirkpatrick´s Four-Level Model. Using this model ensures a holistic view on corporate education services, which includes productivity-relevant aspects that could not be addressed by an analysis of the service delivery based processes. After this analysis it is possible to identify shortcomings of current learning management systems, which bear productivity improvements.

10.4 Learning Management Systems and the Fulfillment of Kirkpatrick´s Four-Level Model

Traditional approaches to education services, where the knowledge is usually achieved through presence lessons, has shortcomings, because participants are not motivated enough to consume knowledge actively (Bates 2000). Information and communication technology gives the opportunity to increase the motivation of the participants of educational services (McCormack and Jones 1997). The use of information and communication technology for educational services is called e-learning and according to the European Commission defined as: “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration” (European Commission 2001). Because of still notable high retention and high dropout rate in online educational services, e-learning nowadays orientates more on communication, collaboration and interactivity face-to-face (Hoic-Bozic et al. 2009). Blended learning combines the advantages of e-learning and the approach of traditional education services, though different learning methods to promote better learning effects (Junxia and Fengli 2007). Different terms are used to describe a system for e-learning and blended learning scenarios such as interactive management, virtual learning environment, content management system, learning content management system and learning management system. Learning management systems has become a default as e-learning and blended learning have been adopted widely (McCormack and Jones 1997).

As specialized Learning Technology Systems, learning management systems are based on contemporary Internet and Web technologies (IEEE 2001). Furthermore, learning management systems implement the open and distance paradigm to provide educational services (Carlson 1998). The learning management system is used to provide a way for enhancing the content and

course integration problem of an education service (Rößling et al. 2008). Lectures and participant of educational services are supported by learning management systems, fundamentally with tools and functions like course and learning object management, asynchronous and synchronous group communication, asessment collection and grading, and education service evaluation (Ceraulo 2005). To give lectures the opportunity to create e-learning material efficiently, learning content management systems focuses on creating learning objects that are used within learning management systems. Lectures can solve the problem of creating learning objects just in time for individual education service participants with their special needs. (Greenberg 2002). State of the art learning management systems are developed in-house or externally and provide the tools and functions as a service to different users within or across national borders (Beck 2005). Learning management systems are provided throughout a commercial company or as open source software. Professional companies develop commercial Systems with standard development methods, the system is tested for bugs, upgrades can be automatically installed, and a possible customization of the system is done by the company itself (Aberdour 2007). Open-source systems overcome most of the disadvantages of the commercial systems, they protect the organization from being bounded to a company and the comstomizaition is much more easier (Kljun et al. 2007). This indicates that if a education service provider need a flexible customizable learning management system, it should come from the open source area.

Brandon Hall (2000, 2005) summarized a more in depth learning management system capability overview. Based on this initial research as well as on the derived requirements on learning by Kirkpatrick, in the following, the requirements are mapped on the capabilities of learn management systems. This is depicted in table 26.

Table 26. Mapping of learning requirements with typical functions of learning management system

	Requirements according to Kirk-patrick
Manages e-learning	L1 a
Management of classroom, instructor-led (ITL) training	L1 a, b, c; L2 a
Performance reporting of training results	L4 a
Learner collaboration	L1 b; L2 a
Keeping learner profile data	L1 a, L4 a
Sharing learner data with an ERP system	L4 a
Competency mapping - skill gap analysis	L4 a
Creates test questions and test administration	L2 a
Management of learning programs and planning (Event scheduling)	L1 c; L2 a

Manages e-learning: According to the mapping shown in table 26., e-learning respectively learning objects like documents, podcasts, videos, wikis, assessments, (social) bookmarks or rss feeds, etc. can be managed by learning management systems within a learning process, and thus it fullfils the provision of learning materials (L1 a).

Management of classroom, instructor-led (ITL) training: Fourthermore, through the management of classrooms, rooms within and beyond the facilities of a service education provider can be managed, this fulfills the requirement of provision of accommodation and other prevailing circumstances (L1 c). In case of instructor-led training the managed rooms can be virtually, utilising video-conferencing rooms, where learning objects can be provided for the education service participants, the participants can get support by collaboration tools and furthermore support for there learning process (L1 a, b; L2 a).

Performance reporting of training results: As a learning management system can be used to report training results to other instances, the customer can receive information about the performance of the education service participant. Therefore, the customer can align the educational service with its intended goals with the given data and information. (L4 a)

Learner collaboration: Learners can collaborate through social networking, forums, blogs, chats, screencasts, etc. to support communication of the education service participants and therefore a learning management system supports the learning process of participants. (L2 a)

Keeping learner profile data: By means of learning management systems learner profile data or any information about the education service participant can be kept, lecturers or participants can comprehend given or used learning objects, thus the requirement of provision of learning materials is fulfilled (L1 a).

Sharing learner data with an ERP system: Through sharing learner data with an ERP system, other instances like the employer or education service provider can comprehend learner data and with the data align the educational service with its intended goals (L4 a).

Competency mapping - skill gap analysis: Furthermore, the alignment of the educational service with its intended goals can be done by competency mapping, e.g. by a skill gap analysis. The gap shows the customer further needs of education services or the results of a present education service (L4 a)

Creates test questions and test administration: Created test questions can support the learning process by connecting them by event scheduling in a timeline with given education service events. (L2 a) Furthermore, the results of the tests support indirectly the alignment of the educational service with its intended goals.

Management of learning programs and planning (Event scheduling): By managing the learning programs and by planning (event scheduling) the education service, events connected to learning objects and facilities of education services can be organized. (L1 c) Once the program is planned arranged learning objects and facilities within a timeline supports the education service participant within the learning process. (L2 a)

The analysis shows that current learning management systems fulfil all requirements concerning reaction and learning. Furthermore, participant-based requirements on the result level are fulfilled, too, but this is just a minor aspect of this level. Measures according to business values are not supported by current learning management systems. Moreover, none of the functionalities provided by learning management systems fulfils the requirements on the transfer level. From a productivity point of view, this level has a high impact on the external productivity, because with a guided transfer the business value on the customer´s side increases.

10.5 Conclusion and Outlook

With this analysis, an evaluation of learning management systems according to Kirkpatrick´s Four-Level Model has been presented. This holistic approach clearly showed that the state-of-the-art in learning management systems does only support the learning process on the levels 1, 2, and minor aspects of level 4. But especially for the transfer utilizable functions are missing. Using a productivity perspective this leads to high potential to increase the output-side of corporate education services, because only if the transfer of knowledge to the job is ensured and explicitly addressed the investment in learning creates business value.

As shown before, learning management systems could address these shortcomings, because the knowledge provided within a corporate education services is already in the system. Therefore it makes sense to add functionalities that directly focus on the transfer of this knowledge. I.e. it is possible to support this transfer by remote feedback cycles where the lecturer can individually help a participant to solve problems of his job with the learned methods. Furthermore it could be a promising approach to define small projects during the service delivery that every participant has to work on in his daily business. These projects could be managed and monitored by the lecturer and corporate supervisors using a learning management system. The advantage of such a solution would be that content of the educational service could decidedly linked to the project or milestones within and therefore provide hands-on support for the participant. Moreover, these functionalities can be used to evaluate the utility of a corporate education service based on actual changes on the job and not only with assessments.

After all we showed which aspects of corporate education services are addressed with state-of-the-art learning management systems on the one hand and on the other hand we derived implications for a better support of the transfer of knowledge, which is a main cause for corporate education. Therefore it can enhance the way of delivering these services and as a next step to evaluate them. This leads to a better understanding of corporate education services for scholars and gives practitioners support for decisions on educational services.

A first idea of the authors is a workflow tool with which it is possible to link the above mentioned learning objects and tools. Participants of the education service would have the opportunity to get supported by learning objects and tools of the learning management system in previously specified times in there workflows. Reached milestones of the workflows would

reveal the learning progress of the participant to responsible instances and incidentally increase the performance of the participant of the education service.

In our further research we are going do focus on the transfer of knowledge and want to design functionalities that support this process to enhance the output of educational services. Furthermore these functions will be evaluated in different corporate education services to ensure the effects.

10.6 Acknowledgement

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11 Post-Project Benefits Management in Large Organizations – Insights of a Qualitative Study

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Abstract

In the last decades, corporate investments in IT constantly increased and became a substantial part of business investments. Thus, researchers have sought to understand the effects of these investments and the practices that lead to more effective investment into IT. One stream of this research focuses on explicitly managing benefits. It links into IT investment appraisals as well as into IT project management with an emphasis on the latter. Extant research of benefits management focuses on the benefits-driven chartering and execution of IT projects. Thus, this research does not address benefits-related effects of the usage phase of IT investments, foregoing the opportunity of managing benefits based on the realization planned and emerging work practices over time. Against this background, this paper aims to identify the current state of benefits management and derives implications for post-project benefits management based on a qualitative study with eleven IT executives (mostly CIOs).

Keywords

Business benefits, CIO, Information systems project management, IS project management, IT Business Value, IT portfolio management, Qualitative research

11.1 Introduction

In the last decades, corporate investments in IT constantly increased and became a substantial part of business investments. In 2010, the amount of IT investments has reached 3.6 trillion $ and an estimation for 2012 of 4.5 trillion $, globally (WITSA 2010). Thus, researchers have sought to understand the effects of these investments as well as the practices that lead to more effective investment into IT. One stream of this research explicitly focuses on managing benefits associated with IT investments (Ahlemann et al. 2013; Ashurst 2015; Balta et al. 2015; Bradley 2010; Doherty et al. 2012; Markus 2004; Serra and Kunc 2015; Ward and Daniel 2013). This research on benefits management focuses on practices that reach from IT investment appraisals into IT project management. Surprisingly, despite this scholarly effort studies consistently report shortcomings in IT benefits realization (Bradley 2010).

Empirical evidence suggests that there is a significant time lack between IS implementation and benefits realization (Brynjolfsson and Hitt 1998; Marchand et al. 2000; Markus 2004; Orlikowski 1996). Similarly, studies show that benefits are only generated if the introduction of new or changed IT is complemented with organizational change (Brynjolfsson and Hitt 1998). This is also recognized in literature on IT-enabled Transformation that emphasizes that capture of benefits is a critical post-project activity (Markus 2004). Moreover, some benefits can result from emergent change that can yield unintended negative or positive effects (Orlikowski 1996). However, while literature proposes first attempts to realize benefits in the post-project phase, there are no studies that explicitly focus on post-project benefits realization in practice. Extant studies with a more general benefits management focus only provide limited evidence on post-project benefits realization activities. Therefore, this is the first study that explicitly focusses on post-project benefits management.

Despite this empirical evidence, success of IT projects is still predominately evaluated against the magic triangle of project management – budget, time, and quality – and not against the realized benefits (Joosten et al. 2014; Nelson and Morris 2014; Petter et al. 2012; Smithson and Hirschheim 1998). This is mirrored in the academic literature that tends to focus on early identification of benefits of projects and the management of such benefits during the execution (Bradley 2010; Braun et al. 2009; Hesselmann and Kunal 2014; Maes et al. 2012; Ward and Daniel 2012).

Less attention has been so far directed towards the management of benefits in the post-project phase, with the notable exception of Ashurst et al. (2008). Moreover, little is known about actual management practices in post-project benefits management as there is dearth of empirical studies with regard explicitly to this phase of benefits management. Therefore, we focus on benefits realization and explication as part of IT-enabled transformation. By doing so, this study is the first that explicitly seeks to understand post-project benefits management. Thus, current research does not sufficiently address benefits-related effects of the usage phase of IT investments, foregoing the opportunity of managing benefits based on the realization planned and emerging work practices over time. This research gap is underscored by Marchand et al., who posit that 80 % of an investments value is realized during the actual utilization in daily business (Marchand et al. 2000). Against this background, this paper aims to identify the current state of benefits management with an organization-wide focus and derives implications for post-project benefits management based on a qualitative study with eleven IT executives (mostly CIOs) in large organizations.

While our research interest focuses on post-project benefits management, we recognize a strong interdependence of post-project activities with all preceding project activities, as pointedly argued by Markus (2004) for the technochange lifecycle. Thus, we seek to investigate activities related to benefits management prior to, and during the project as a precursor of understanding post-project benefits management.

The remainder of the paper is structured as follows. In the next section, relevant theoretical foundations are introduced. After that, the research methodology is transparently described and the actual collection and analysis of the data is shown. After that, results are derived from the data and discussed with a focus on recent approaches of benefits management, shortcomings of this practice, and the derivation of implications for practice as well as scholars. The paper closes with a conclusion to summarize the findings and gives an outlook for scholars as well as practitioners.

11.2 Theoretical Foundation

11.2.1 Benefits Management

Benefits management gained broader scholarly attention during the mid-1990s through a study conducted in Great Britain (Ward et al. 1996). In this well cited study the term benefits management is defined as „the process of organizing and managing such that potential benefits arising from the use of IT are actually realized" (Ward et al. 1996). Despite this encompassing definition without an explicit focus on projects and project management, literature on benefits management assumes it consistently. Based on the findings and the lack of methodological support for benefits management the Cranfield Benefits Management Model (Figure 10) was derived. It is well accepted and a starting point for various research approaches on benefits management (Ashurst et al. 2008; Eckartz et al. 2012; Ward et al. 1996). It consists of five phases starting with the identification and structuration of benefits (1). Relationships between functionalities and arising benefits should be identified in this phase. Moreover, ownerships and responsibilities for each benefit have to be defined. The results of this phase should be

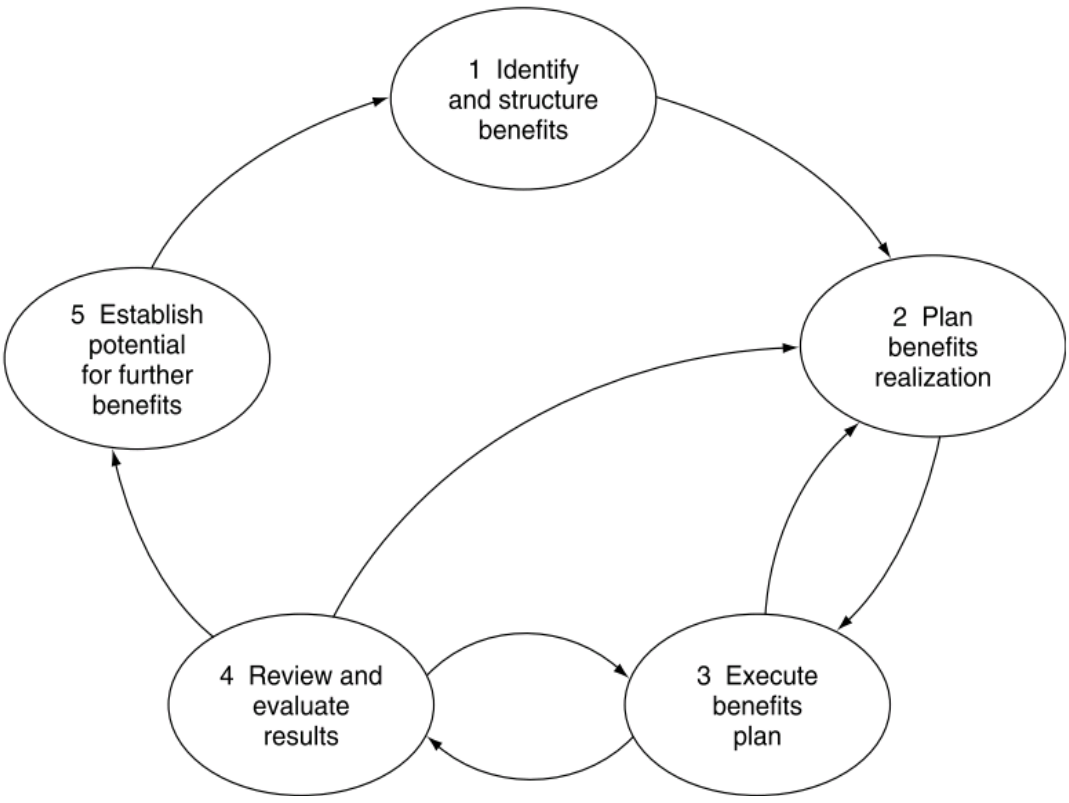

Figure 10. Cranfield Benefits Management Model (Ward and Daniel 2006)

integrated into a business case. After that the realization of benefits (2) is planned. Major outcome of this phase is a finalized business case and detailed descriptions of each benefit. This should include measures as well as agreed responsibilities to be able to manage benefits later on. The third phase describes the execution of the benefits plan (3). This is done during the runtime of the project. The main task in this phase is to monitor the progress of the realization of benefits and to act if issues occur and unplanned events happen. After completion of a project the results have to be reviewed and evaluated (4) to determine if benefits have been achieved. Furthermore, this phase helps to identify benefits that were only partially realized or could not be realized at all. Based on this information it is possible to take action. This also refers to unexpected benefits. Lastly, potential for further benefits has to be established (5). During this phase further benefits should be identified to take them into consideration for future projects. This phase is implicitly grounded after the adoption of the project's results is completed which relates to the time lag between introduction and the actual realization of benefits in the operation.

Besides the latter phase of the Cranfield Benefits Management Model, there are other suggestions for realizing benefits of IT investments in the post-project phase. These approaches emphasize the realization of planned benefits by way of changing organizational work practices (Ashurst 2011; Ashurst et al. 2008; Bradley 2010; Breese et al. 2015; Melton et al. 2011). Most of these approaches suggest tracking benefits realization according to predefined measures, e.g. through conducting a post-project benefits review (Melton et al. 2011). Others suggest an ongoing management of planned benefits by linking it to general performance management functions (Melton et al. 2011) or establishing ownership for continued benefits exploitation (Ashurst et al. 2008).

In addition to the Cranfield Benefits Management Model, Ward and Daniel established the Benefits Dependency Network as a tool to visualize and analyze the interdependencies between benefits (Peppard et al. 2000; Ward and Daniel 2006). Despite these scholarly efforts, the application of benefits management remained insufficient and lead to more practitioner-driven approaches (Ashurst 2015; Bradley 2010; Jenner 2012; Melton et al. 2011). All in all, the diffusion of a formalized benefits management is still slow (Ward et al. 2007b). In a recent literature review on benefits management from a project perspective (Braun et al. 2009) one reason becomes visible. The study shows that in post-project phases there is no method or concept established to support emerging benefits as well as identified but unrealized benefits. This is

contradictory to empirical evidence that suggests that organizational change has an emerging character (Brynjolfsson and Hitt 1998; Markus 2004; Upton and Staats 2008).

According to this, three important aspects of post-project benefits management can be identified. Firstly, post-project benefits management builds on benefits-related activities before and during the project. Secondly, the realization and exploitation of benefits only materializes once the output of the project is used in an organization. Thus, post-project benefits management significantly outlasts the project and needs to be embedded into the usage phase. Lastly, benefits from IT hinge on effecting organizational changes that improve the performance of the organization. Considering these three aspects, benefits management should be conceptualized as an integral part of a wider transformational framework that focuses on improving organizational performance with IT. This phenomenon is convincingly summarized in the technochange framework that can be seen as the broader context of technochange.

11.2.2 Technochange

Technochange focuses on "[…] using IT strategically to drive *organizational* performance improvements […]" (Markus 2004, p. 4, emphasis in the original). While projects are pivotal phase in the technochange framework, Markus extends this view to those activities before and after the projects that are essential for effecting organizational improvements, namely the chartering phase prior to the project and the post-project phases of shakedown and benefits capture (Markus 2004). In doing so, technochange emphasizes the shortcomings of a project's understanding of being solely views as an IT project or an organizational development project. Technochange projects, by contrast, inextricably link technology and organizational change (Markus 2004). Unsurprisingly, most projects can be seen as technochange projects because on the one hand, typical IT projects like implementation of software require organizational changes in terms of workflows and trainings for employees. On the other hand, business projects as well require changes in the corporate IT. Due to this character of technochange projects they embody a huge risk of misalignment because the IT part of the project is often seen as given and therefore, does not fit the organizational change intended (Markus 2004). To align both perspectives on a technochange project, the framework implements an integrated view on technological and organizational aspects of a project to ensure that both parts jointly affect an organization. Moreover, from a benefits management perspective technochange incorporates highly relevant effects as the time gap between the implementation and realization of beneficial effects.

Technochange thus provides a conceptual framework for understanding benefits management in the context of transforming organizations with IT. The technochange lifecycle emphasizes pre-project activities as well as post-project activities that are critical for realizing desired improvements in organizational performance, as shown in table 27. We summarize the key lifecycle activities according to Markus (2004) and explicate the link to benefits management: Firstly, the chartering phase describes the initiation of a project from a first idea that is developed to a project proposal. Here, the organization needs to understand the high-level benefits that could accrue from the project. Based on such an assessment, the project may receive approval and funding. The following project phase describes the actual project that develops a technochange solution. Typical activities are the allocation of resources according to a project plan, the development of the IT solution, and in conjunction the planning of the organizational change. Additionally, the formal introduction of the solution and user trainings is subsumed in this phase. Shakedown is the phase in which the organizational changes take place and the adaptation of the solution begins. The project results should be analyzed to identify problems and rework technological and organizational issues. Lastly, the benefit capture phase describes the realization and exploitation of a project's benefits. It is also the phase where the solution should be continuously improved to raise the benefits. Especially, emerging benefits are focused in this phase to improve operations based in the user's experiences (Markus 2004).

Table 27. Phases of the technochange lifecycle (Markus 2004)

Phase	**Chartering**	**Project**	**Shakedown**	**Benefit Capture**
Motto	'Ideas to Dollars'	'Dollars to Solution'	'Solution to Usage'	'Usage to Dollars'
Description	Phase during which the technochange idea is proposed, approved, and funded	Phase during which the technochange solution is developed and technology is acquired or built; ends when technochange starts up or 'goes live'	Phase during which the organization starts operating in a new way with technology and the organization troubleshoots problems associated with technology and new processes; the goal of the phase is 'normal operations'	Phase during which the organization systematically derives benefits from the new way of working; may involve continuous improvements, 'upgrades', and 'conversions' of various kinds

Markus and Tanis highlight the dependencies of the activities across all phases of the lifecycle. In particular, they introduce the notion of exported problems (Markus and Tanis 2000). Exported problems are issues that remain unresolved in the phase in which these problems originated. Due to changing management responsibility for each technochange phase, such unresolved problems are likely to be undetected by responsible managers in the succeeding

phase. Markus (2004) illustrates that such exported problems can have substantial negative impact on technochange success and, by implication, on benefits realization and exploitation. Thus, successful post-project benefits realization not only requires an effective information flow about expected benefits but also an information flow about potential project-induced risks for benefits realization across the entire technochange lifecycle.

11.3 Methodology, Data Collection and Analysis

While the study's main aim is to understand current practices post-project benefits management activities of large organizations, the dependencies on these activities on prior phases led us to the adoption of the technochange lifecycle as a guiding framework for our data collection and analysis. Within the interviews we took an organization-wide focus to ensure an encompassing view on the organizations. Due to the exploratory character of the study, semi-structured interviews were utilized to gain insights into current practice of benefits management in large organizations (Myers 2013; Myers and Newman 2007). The guideline for the interviews was inspired by the technochange lifecycle and its phases as well as by research on benefits management. Before conducting the interviews, a group of six experienced academics and consultants evaluated and refined the guidelines during a workshop.

All interviewees were briefly introduced to the technochange lifecycle. Then, the interview guideline consisted of seven open questions to enable the interviewees to relate to their individual organizational context. Following the introduction of the technochange lifecycle the interviewees were asked to respond to pick and illustrate a recent example of a technochange project in their own organization. While specifically emphasizing the chartering and post-project benefits capture, the open nature of the question and the initial comprehensive technochange project example led the interviewees to discuss benefit related activities and measures across the entire lifecycle. This strengthens the assumption that all phases are highly related.

Each interview lasted between 60 and 90 minutes and was conducted by two to four researchers. All but two interviews were conducted in presence at the interviewee's office. The selected interviewees were eleven top-level managers with a strong background in IT as well as business. All interviewees have had long-term experience in project management and have taken responsibility for at least a large part of their corporate IT. The sample represents six different industries. Regarding the size of the companies, the sample includes companies with 3.000 to

over 500.000 employees and revenues in 2013 of at least 400 Mio. €. An overview of the participants is given in table 28.

Table 28. Profile of Interviewees

ID	Role	Industry	Revenue	Employees
A	CIO	Retail	7.158 Mio. €	2.978
B	CIO	Transportation & Logistics	39.119 Mio. €	30.6919
C	COO	Finance	Unspecified	Unspecified
D	CIO	Transportation & Logistics	4.180 Mio. €	19.927
E	CIO	Transportation & Logistics	424 Mio. €	4.836
F	CIO	Transportation & Logistics	Unspecified	Unspecified
G	Vice-CIO	Automotive	197.007 Mio. €	572.800
H	CIO	Transportation & Logistics	20.929 Mio. CHF	62.744
I	CIO	Energy	122.450 Mio. €	62.239
J	Director	Public Services	Unspecified	Unspecified
K	Senior Manager	Finance	1.800 Mio. €	3000

After the data collection, each interview was transcribed. The resulting qualitative data was analyzed with the help of the qualitative content analysis that was incorporated by two independent researchers (Flick 1992; Mayring 2010). Therefore, codes were derived deductively based on the technochange lifecycle and the guideline. After the analysis of the first five interviews the codes were inductively revised to take the gained experience in the research area into consideration. Two researchers who did the coding independently ensured the intercoder reliability of the data analysis. The results of the coding were stable and therefore, the reliability of the analysis is proven.

11.4 Results

Like in other studies before, our results show that in all cases benefits are considered during the chartering of projects (Breese et al. 2015; Maes 2014; Ward et al. 2007a). All interviewees incorporate *business cases* to deal with project appraisals in a structured way. Those business cases include a statement on benefits of a project. Moreover, eight companies have a project *portfolio management process* to foster structured decisions on future projects. Three cases are noteworthy because the project portfolio management process is embedded in the IT department and manages over 90 % of their corporate projects. All cases differ concerning the frequency of decisions from continuous planning to annual planning. Interestingly, only in one case a commitment to the benefits in terms of accountability is mandatory. Lastly, one company established *competence center* to catalyze subject-specific idea generation, i.e. data-driven business development, considering recent and future demand of the organization.

During the project phase four different approaches can be observed. Firstly, four companies start to use *agile methods* for projects to involve the customer or user of the projects' results during the whole development. By utilizing agile methods organizations seek to ensure the realization of benefits due to the integration of users and customers. Moreover, it bears the possibility to continuously identify not anticipated benefits. This practice is mainly applied in small projects to gain experience with these methods and to identify potentials for future utilization in larger projects. In one case, agile methods are mentioned as promising in complex settings with changing demands, but nevertheless, the duration of these projects is short and the budgets low. Secondly, one case organization uses a continuous *demand management* process for long-term projects to control the benefits during the lifecycle and to be able to include new benefits that occur while the project advances. By doing so, the organization can handle the realization of benefits even after projects are closed, and therefore, the demand management is independent from individual projects. It focusses on specific IT services and business issues that are engaging in an ongoing dialogue with the business side. Thirdly, an organization explicitly strives for continuity in the project team and *continuous accountability* during the project. Hereby, the risk of exported problems is minimized because there is no advantage in delaying issues. Lastly, an independent *project insurance group* accompanies large projects in one case organization. This group is attending all meetings of the steering committee and aims for an independent assessment of the project's risks. As an independent instance in the project organization the project assurance group is mediating conflicts and obliged to report directly to the CIO. Therefore, this organizational unit can help to ensure successful projects that imply organizational change.

The utilization of methods to manage benefits during the shakedown phase is even patchier than the project phase. Three case organizations use *project reports* to reflect on the course of the project. The focus of these reports varies from an overall assessment of the budget, time, and quality to a focus on benefits and why these are not realized. However, all methods take a retrospective view on the project with the goal of organizational learning for the future and do not strive for an improvement of the project analyzed. Another case organization evaluates the results of the project during the shakedown by user assessments that can lead to new projects to improve the results. Similarly but without a structured process, another case organization reacts on user issues with requests for change or new projects. Lastly, a case organization established an *honest project handover* between the accountable project lead and the prospective

accountable employee of the business unit. When these two parties meet all issues and shortcomings of the project should be openly addressed. Thus enabling the business unit to adjust current practice and to decide about further actions required to realize potential benefits.

Methodological support in the benefit capture phase is fragmentary. Only one organization monitors the realization of benefits after the shakedown phase in a structured way. Based on reports on the use of a new solution the actual development is compared to the anticipate development. This monitoring results in change requests that lead to the realization of new benefits during operation or by small follow-up projects. However, this monitoring is unique in the organization due to the character of the project that aims for the development of a new customer segment. Four case companies evaluate the project's results with a time gap of three to twelve months. Controlling the anticipated benefits based on monetary parameters mainly drives this assessment. One case company assesses the realization of benefits by informal talks to the business unit assuming that issues with the results would be communicated. Lastly, two organizations have or plan to have a strict *benefits collection* based on the business case. By doing that the budgets of the ordering party are rigorously cut by the amount of savings that had to be exactly stated in the business case. The results of the eleven interviews are summarized in table 29.

Table 29. Results of the interviews

	Chartering	Project	Shakedown	Benefit Capture
A	• Project portfolio management process with scoring mechanism to evaluate ideas • Bimonthly decision making • If a project scored good enough a business case is developed			• Evaluation of the benefits after 6 (standard) or 12 months by project lead, project sponsor, and controller. • Future plans: Strict benefit collection in terms of budget reductions according to the previously stated benefits is discussed
B	• Well defined project portfolio management process with business cases as the main document to approve projects	• First small agile projects to gain experience • Independent risk assessment		• Based on the initial efficiency calculation, the benefits are assessed and collected after the project is completed
C	• Project portfolio management process that includes IT as well as business projects • Development of a business case if the idea fits into the scenario		• Handover between project lead and team lead. Honest assessment of the project's state and issues	
D	• Project portfolio management process on an annual basis • Business case			• After large projects reviews can be done or after 6 months there are meetings to assess if the solution “feels” beneficial.
E	• Business case is the main document to initiate projects			• Sometimes monitoring of anticipated development • New benefits are realized in new projects / next releases
F	• Project portfolio management process • Large Projects are initiated with prototypes to gain business commitment • Decisions based on Business cases		• Follow-up tasks are defined during the formal closure of a project, based on the assumption that 20% of anticipated features and benefits are not realized	

	Chartering	Project	Shakedown	Benefit Capture
G	• Project portfolio management process • Business case	• Agile projects; especially in complex settings successful • Continuous demand management during the project to gain more benefits; decisions by the change advisory board		• User assessments • 3 months after shakedown a benefit assessment takes place
H	• Definition of benefits and their measurement • Benefit commitment as part of the business case • Continuous planning and reporting	• Agile methods are utilized basically customer interface projects with short duration (2 days) • Continuity in accountability; only minor changes in project team	• Minor improvements are realized within change request otherwise a new project is initiated • Business review compares results after rollout with business case. If necessary gap analysis	
I	• Project portfolio management that includes about 90% of all corporate projects because they deal with IT • Benefits have to be identified and defined in the business case • Competence center	• Agile methods are utilized in small projects to gain experience	• Project post mortem done by the project lead; external second opinion if necessary	
J	• Annual planning • Monetary benefits are main drivers of business cases		• Mandatory project report (only done, if successful)	
K	• Project lead not accountable in terms of benefits - only during project • In few cases monitoring and management after the project	• Qualitative benefit assessment during project		• Continuous improvement with follow-up projects

11.5 Discussion

11.5.1 Approaches to managing benefits

The consistent use of benefits management methods during the chartering phase is not mirrored in later phases of the technochange lifecycle. Benefits management at the end and after the project is at best patchy across organizations. During the chartering phase it is broadly accepted

that *business cases* are utilized to propose benefits (Maes 2014). Furthermore, all case organizations have implemented a project *portfolio management* process to enable structured decisions on projects and portfolios to align their impact to the business or IT strategy.

Significant differences begin to show with regard to benefit management in the project phase. Two methods are mentioned in the study. One firm uses a *project assurance* approach. This entails a continual auditing process during the execution of the project that is independent from regular project leadership and able to report directly to senior management. The aim is to identify and monitor risks according to the realization of benefits. Another approach is the adoption of *agile project methods*. Those methods suggest short cycles of interaction between the project team and customers or business units (Wixom et al. 2013). This constant feedback seeks to deliver results that are useful to customers and thus helps to realize expected and new benefits.

After the project phase, one organization used an *honest project handover*. After the project phase, one organization used an honest handover. This entails a thorough assessment of a project's results. Following, an open communication of the solution, shortcomings, and potential functionalities that can be beneficial are discussed. The goal is to enable an ongoing improvement of the project results. This requires an organization to accept the explicit communication of addressed shortcomings and unresolved issues of a project. Besides, such practice can help business units to adjust expectations on projects results by knowing issues that can be dealt with in an improvement during the usage phase. Thus, potential reservations concerning the projects results can be reduced. Another more formalized approach towards a structured handover is the *post mortem analysis*. On the one hand, it enforces to state possible deficits and on the other hand, helps an organization to learn from past projects.

As these results show, during the shakedown phase only very few organizations try to adjust the projects' results with minor, timely changes that could help to adapt organizational change and to enhance already partially realized benefits. It is common practice to initiate follow-up projects to deal with unresolved issues. This assumes that a contemporaneous realization of these follow-up projects is reasonable. Yet, the results show that continuous approval of project appraisals is not possible according to cyclic planning of projects. Thus, the shortcomings of a project can only be resolved with a remarkable time lag. This also assumes that resources are available and that it is prioritized higher than regular project proposals. Consequently, it cannot

be assured that issues on a projects' result raised after the formal closure can be resolved contemporarily.

The state of practice is particularly patchy with regard to ongoing benefits capture, the last phase of the technochange lifecycle. A few organizations use loosely structured *benefit reports* to track if the results meet the requirements of the users and deliver expected benefits. In some cases this is done after a period of up to twelve months to ensure that the adoption is completed. In general, those reports lack a comparable metric to evaluate the benefits captured. Moreover, the aim of those reports is mainly to learn from the formally closed projects. The most rigorous method, namely *benefit collection*, are utilized by two organizations to monitor the business case consequently. Benefit collection drives organizations to measure actual performance against the targets of the original business case, delivering a validated estimation of a project's effect on the business. However, experts comment that original benefit targets may have become (partially) irrelevant by the time of benefit collection given the dynamics of larger organizations and an extended time-span between chartering and benefits collection.

Two of the organizations try to enhance the realization of benefits by establishing overlapping organizational structures to manage benefits throughout the technochange lifecycle. One organization introduced permanent competence center for the implementation and improvement of a specific enterprise-wide information system. The competence center can identify, monitor, and foster benefits not just for a single project but within all projects and activities related to the system. Another organization used competence centers to drive all projects related to specific areas of IT innovation, i.e. data-driven business development, to bundle knowledge and to strengthen project appraisals. In addition, the CIO of a third organization argued that benefits management is embedded in an ongoing *demand management* process that also served as key liaison between business and IT in this organization. This demand management process governed the ongoing benefits-informed dialogue about IT demands between specific business units and their associated demand managers in the IT organization. An overview of the methods used in the phases is given in figure 11.

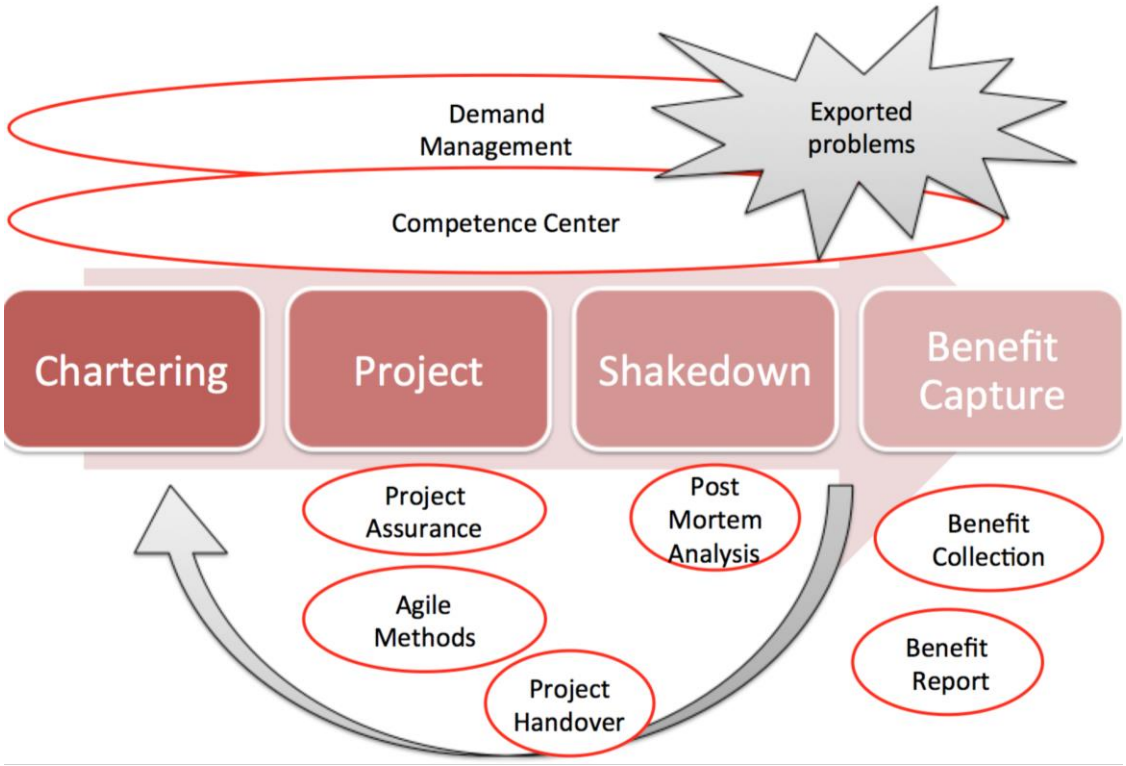

Figure 11. Tools utilized to capture benefits

All organizations share the understanding that the overall responsibility of technochange projects has to be embedded in the business unit because this is where the results are utilized. Moreover, it is well understood that co-ownership of business and IT during the project is helpful, but only very few exceptional cases understand co-ownership in terms of benefits capture. According to the lack of structured methods to accompany the benefit capture phase the chance to lever potential benefits is low. It seems like emerging benefits can only be realized if a benefit is identified by accident and a follow-up project can timely be realized.

11.5.2 Towards effective post-project benefits management

Based on the results of the analysis, three main shortcomings of current benefits management practices can be identified that affect post-project benefits management. Despite our focus on post-project benefits management, it is crucial to consider all phases of the technochange lifecycle. Without this broad perspective, it is not possible to derive implications for post-project management. Even, if benefits are well described during the chartering phase, a discontinued management of benefits during the project can negatively affect post-project benefits management. For example, the transformational nature of technochange projects can lead to long durations of project. With increasing duration of a project, the business context and need may change, requiring adjusting projected benefits during the projects. Similarly, project-specific

risks such as scope cuts can inhibit the realization of originally planned benefits. Thus, the focus of the identified shortcomings and implications is broader than only on post-project benefits management. The main shortcomings identified are the changing and unclear *responsibility (1)* for ongoing benefits management, the management of benefits during the *project phase (2)*, and the *lack of proactive approaches (3)* during shakedown and benefit capture.

Responsibility (1): The study points to a responsibility problem for benefits management, as responsibilities for managing benefits across the technochange lifecycle are changing and sometimes unclear management. In the beginning, there is evident managerial responsibility for the planning and committing to benefits in the business case. During the project and the shakedown phase, the responsibility is often delegated and subject to change. In the post-project phase the responsibility is handed over to the business units. This changing responsibility may blur accountability for benefits realization and exploitation, only aggravated by exported problems that facilitate shifting blame for unrealized benefits to someone else.

However, all organizations strive to establish a clear responsibility of the initiating top-level management or business unit for managing benefits in technochange projects. Some organization even assign responsibilities for specific planned benefits to individual business stakeholders. This is similar to creating benefits realization plan as proposed by Ward and Daniel (Ward and Daniel 2012). The intention of this practice is to define who is tasked with realizing benefits both during and after the project. Yet, our analysis indicates that in practice this responsibility is at risk to become blurry after the chartering phase Continuity in responsibility may be difficult to maintain because of transient governance structures of projects and the dynamics of (large) organizations.

Organizations thus need to work out ways to establish a continual management of benefits outlasting individual projects despite these inhibitors (I1). One way is to embed benefits management in regular processes or organizational functions at the interface of business and IT, such as several organizations did with their demand management processes or competence centers. Moreover, continuous improvement processes should be adapted to specifically focus on IT-related benefits to realize emergent effects during the usage phase.

Another way is to institute a responsibility for scheduled instances of benefit assessments. Even if an organization lacks a continuous and detailed management responsibility for benefits realization across the lifecycle, such assessments can prompt a renewed assignment of such responsibilities during or after a project based on a current account of the state of benefits realization.

Management during project phase (2): Our study shows that during the project phase the management of benefits is not consequently done. Given a dynamic environment, this lack of focus leads to an inferior realization of benefits. A promising approach to deal with this shortcoming is to integrate users in an iterative development process to improve the fit of the anticipated solution. By doing so, benefits can be validated during this phase.

The results clearly show that all organizations are aware of benefits and understand the need to clearly identify, define, and monitor them. It can be observed that all organizations utilize methods throughout the chartering phase to ensure that the investments into projects are beneficial and follow a stringent business logic. This is done by well-understood practices like business cases and portfolio management. These incorporate benefits systematically. Moreover, responsibilities are defined and measures to manage benefits are partially established. Based on this general understanding of benefits and their importance, it is very revealing to study the following phases of the technochange lifecycle. During the project phase, the management of benefits is increasingly out of focus as organizations emphasize project management with regard to time, budget, and functionalities.

None of the organizations applied specific benefits management methods from extant literature. Additionally, methodological support gets less specific over the course of a project. Given the aforementioned dynamics, the realization of benefits gets aggravated. Only five organizations try to manage benefits during the project phase, albeit without considering any specific published benefits management methods. Four cases show that agile project methods are seen as a way to foster benefit realization. Agile methods allow for a continual identification and management of benefits throughout a project due to the iterative delivery of results as well as ongoing integration of users and/or customers. These findings show that despite scholarly efforts and a high awareness in practice, benefits management does not yet fulfill its full potential in organizations. In this phase, a broadened integration of users could help to enhance the project teams understanding of work practice and consequently emphasize benefits during this phase. Even more, an iterative development approach could result in a more beneficial implementation

of needed functionalities (I2). As of now, functionalities are not evaluated regarding potential benefits added. Moreover, an iterative development process during the project phase can improve the appropriateness of a solution. A method that some companies try to utilize is agile approaches to gain more insights into users in dynamic circumstances. Such approaches could implement a benefit view through a broadening of user stories with benefits explicitly addressed in these stories. In doing so, user stories could be a tool to ensure that not only functionalities are implemented by users' demand but also benefits are utilized to prioritize the progress of a project. Moreover, the utilization of agile methods bears the potential to decrease the time lag between transition and the occurrence of a project's effects on work practice.

Lack of proactive approaches at the end of the technochange lifecycle (3): After the project phase, the results of the study show that organizations are aware of benefits and reviewing them. Nonetheless, the focus of the activities lies on organizational learning for future projects and changes. No approaches are taken to embed a proactive management of benefits during these phases. By doing so, organizations could ensure the realization of anticipated benefits that could change during the course of a project. Additionally, emerging effects could be identified and used to realize further benefits. This should be done in a timely manner.

Interestingly, many organizations utilizes some approach for benefits management during the shakedown or benefit capture phase. This fact underlines the importance of benefits and the relevance in organizations. However, the methods utilized mainly focus on the post-hoc reflection of projects to capture lessons learned and often do not incorporate benefit management methods. Current approaches taken by organizations try to support organizational learning through monitoring and evaluation after a project is formally closed. This retrospective character is useful and needed to improve project management and avoid failures in future projects.

However, a retrospective approach does not provide guidance for improving benefits realization or even the exploitation of new or emergent benefits. This requires an action-oriented approach during the transition and especially early usage phases (I3). By monitoring anticipated benefits it is possible to track and foster the realization of benefits. Based on the experience of the users, actions like additional trainings or adaptations in routines can be realized to ensure the capturing of planned benefits as well as the discovery of new benefits. Only one organization has a structured and timely way to handle emerging benefits in the shakedown phase by encouraging benefits-related change requests.

Many interviewees are aware of the time-lag between implementing a technochange and benefits capture. By instituting assessments, some organizations seek to keep track of benefits realization. These retrospective approaches, however, generally do not foster the identification of emergent new and benefits are missing. Following this argumentation, benefits management practice should thus seek to assess unrealized planned benefits as well as identifying new and emerging benefits in the post-project phase (I4). None of the organization seem to have specific methods or tools to deal with unintended effects or new or emergent benefits of a technochange solution. Most critically, this implies that organizations need to find ways to enable timely follow-up actions for benefit realization and exploitation in the post-project phases (I5). Only one organization in our study uses a systematic way to identify emerging benefits and initiate timely technochange activities in the usage phase for benefits exploitation. Such timely action is inhibited in many organizations as new technochange activity could require a new technochange project that requires long-winding planning and approval processes, leading to missed opportunities or significant time-lags for capturing benefits.

As the results clearly show, many organizations lack consistent practices to manage benefits in the post-project phase. This phase encompasses the shakedown where the projects results are transitioned to productive use and the benefits capture phase. Those are crucial for benefits realization because here the results are implemented in the business for effecting performance improvements. Due to the lack of structured possibilities to deal with users' experience and emerging potential benefits, current practice misses the opportunity to gain more benefits. The survey of current practices thus can help to assess individual organizations and their practices especially in this crucial phase. It also shows that in practice some promising project independent approaches were utilized to manage benefits that have not been sufficiently captured in research on benefits management. Even more, the study shows that there seems to be a need for embedded methods of benefits management that are well aligned to already used methods to lower the burden of implementing new activities that on the first hand seem to be even more organizational overhead. Based on these findings, the derived implications for post-project benefits capture are shown in table 30.

Table 30. Implications for benefits management practice

Phase	Implication
General	• Enforce continuity regarding management of benefits that outlasts projects (I1)
Project	• Integration of users and iterative development to gain better understanding of work practice to improve solution fit (I2)
Post-project	• Accompany transition and early usage phases with an ongoing action-oriented approach instead of only a retrospective one (I3) • Identify emergent benefits after the transition is completed and regular work practice is achieved (I4) • Establish ways to deal with improvements through timely follow-ups (I5)

11.6 Conclusion

This paper seeks to gain insights into current practice of large organizations on benefits management and to give implications to improve this practice especially in the post-project phase. Therefore, a qualitative study with eleven top management interviewees (mainly CIOs) was conducted to assess the application of structured methods and tools to manage benefits and to identify shortcomings of it. The results clearly show that the organizations are well aware of benefits. They understand the need to clearly identify, define, and monitor them. Moreover, responsibilities for benefits are established in most organizations during the chartering phase. Hence, established methods like business cases and project portfolio management are state of the art and are used to deal with benefits. Despite this general awareness, the methodological support of benefits management decreases after the chartering phase. Although, all companies utilize methods in the shakedown and benefit capture phase, these methods are only meant to be supportive to the organizational learning processes by collecting lessons learned and to evaluate the results of a project. None of the methods help to realize benefits. Furthermore, the emergent character of organizational change is not considered. As a result, potential emerging benefits cannot be managed in a structured way. This also implies that timely improvements on solutions can rarely be realized with follow-up projects.

Based on these findings, five implications are derived to strengthen the realization of benefits in the post-project phase. It is considered, that these implications lead to a more user-focused management of benefits with the goal to improve solutions during the usage phase while taking user experiences into account. By doing so, the large amount of time after the formal introduction of a solution to realize benefits and the emergent character of organizational change is taken into account (Brynjolfsson and Hitt 1998; Marchand et al. 2000; Markus 2004; Orlikowski 1996).

These results are limited due to the industry bias on transportation and logistics with five out of eleven case companies from this industry. Moreover, all participating organizations are located in Germany, Austria, or Switzerland. Nevertheless, the results are in line with the findings of Ward et al. regarding the awareness of benefits (Ward et al. 2007a).

Based on these findings, several implications for practitioners as well as scholars occur. Current benefits management practice insufficiently handles the post-project phases. Despite the knowledge of the time gap between the closure of a project and the occurrence of the effects of an organizational change, organizations do not realize potential improvements or benefits due to the lack of flexibility in the post-project phase. Moreover, co-ownership could help organizations to align business units and IT in terms of benefit capture to improve the overall performance of the organization.

Future research should analyze the few methods applied in detail to get a better understanding of the shortcomings and barriers that impede a structured benefit realization. Such in-depths studies can identify weaknesses and could help to improve current methods or lead to new approaches of benefits management. Additionally, it is promising to explore the business side's perspective on post-project benefits management, because the actual realization takes place in the business units. Therefore, insights of the counterparts of CIOs could enrich further research and help to reduce barriers. Moreover, it is promising to broaden the view on benefits management and to seek to integrate post-project benefits management in encompassing processes like project portfolio management. This could possibly lead to a benefits management that is detached from single projects and their limitedness regarding time. Thus, more structured methods could be applied to handle emergent potential benefits as well as to adjust project results in a timely and more flexible way.

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12 How to Empower Users for Co-Creation – Conceptualizing an Engagement Platform for Benefits Realization

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Abstract

Organizations invest huge portions of their budget in IT with the goal to realize benefits as improving work practice and establishing new processes. To achieve this goal, users are engaged throughout projects by various methods and approaches. Nevertheless, after the completion of a project, users lack power and opportunities to further realize benefits and thus assuring the overall success of a project. To close this gap, we present the concept of an engagement platform that empowers users collectively to induce change initiatives that enhances the realization of benefits in the post-project phase. By doing so, benefits management practices undergo a paradigm shift from recent top-down management towards bottom-up realization of benefits. This change in perspective also incorporates a service systems perspective as it focusses on the dynamic configuration of actors and resources to enable value creation in a complex context.

Keywords

service system engineering, software introduction, technochange, user-generated services, benefits management

12.1 Introduction

Organizations invest huge portions of their budget in IT with the goal to realize benefits as improving work practice and establishing new processes (OECD 2015; WITSA 2010). To achieve these objectives, IT investments must be well embedded in the organizational context resulting in complex project constellations. Additionally, anticipated benefits of the software can only be created in distinct contexts by various users utilizing the software. Thus, projects contribute to a service system, as a sociotechnical artifact in a distinct organizational environment is instantiated (Böhmann et al. 2014). Following, benefits realization is done by using this sociotechnical artifact in a specific context while integrating various resources and actors (Böhmann et al. 2014). Engaging users is therefore state of practice during projects by various methods and approaches (Conforto et al. 2016; He and King 2008). This engagement is done by selecting some users with a top-down approach within the project. This top-down approach is advantageous to get projects approved and delivered. Whereas a much broader or even general participation is complex, expensive and hard to keep target-oriented during a project. Especially, considering major changes in software as introductions of new software or significant upgrades only representing users can be engaged efficiently throughout the project. Thus, most users cannot actively participate in the adaptation of software and organizational changes. Even more due to the context of use that is defined by the actors involved and the organizational boundaries this limited engagement leads to limited ability to realize benefits entirely. This limitation even increases after the completion of a project, users lack opportunities and power to further realize benefits and thus assuring the overall success of a project (Semmann and Böhmann 2015). Recent literature reviews on benefits management from a project perspective (Braun et al. 2009; Hesselmann and Kunal 2014) show that, in post-project phase, there is no established method or concept to support emerging benefits as well as intended but unrealized benefits which is also reflected in a qualitative study (Semmann and Böhmann 2015). This lack of engaging users is also mirrored as a third of installed software in organizations is estimated to be not used at all (1e Limited 2015).

By utilizing a service systems perspective with the users as facilitators of value in context, a bottom-up approach seems more beneficial to enhance capturing of benefits to overcome these limitations in the post-project phase. Especially, regarding varying time lags and emergent benefits that have not been anticipated (Brynjolfsson and Hitt 1998; Marchand et al. 2000; Markus 2004; Orlikowski 1996). Based on this perspective, a shift towards a bottom-up approach for

enforcing co-creation within the community of users to further realize benefits and thus improving the solution and its value delivered collectively (Lusch et al. 2007; Ng and Smith 2012). A promising approach to instantiate such a bottom-up engagement platform is internal crowdsourcing as it aims for collaborative value facilitation within an organization by potentially engaging all users (Zuchowski et al., 2016). This active engagement also copes with the need for organizational change that complements new or changed IT to realize benefits (Brynjolfsson and Hitt 1998). This is also recognized in literature on IT-enabled transformation that emphasizes that capturing benefits is a critical post-project activity (Markus 2004). Following this argumentation, the paper answers the following research question: How can a concept to empower users for co-creation of change initiatives be designed to enhance the possibilities to realize benefits?

We do so by presenting the concept of an engagement platform that empowers users to collaboratively induce change initiatives that enhances the realization of benefits in the post-project phase. The resulting platform seeks to catalyze the potential of value co-creation as it decidedly addresses the context of users' engagement with the delivered software during the introduction. To enable value creation between actors of the service system, users should be empowered to implement change initiatives and thus, foster timely realization of benefits. This novel approach exceeds common crowd initiatives established for example within innovation management as change initiatives are not only identified and ranked, but explicitly realized within a specific organizational context.

Thus, benefits management practices undergo a paradigm shift from recent top-down management towards bottom-up realization of benefits. This shift has the potential to increase the ability to change organizations and their work practice drastically (Kumar et al. 2016).

As service research (Böhmann et al. 2014) as well as design research (Iivari 2015; Niederman and March 2012) calls for evidence-based cumulative research, we propose the concept to an engagement platform as the result of the design phase of our design science project. The remainder of the paper is therefore structured as follows: the second section builds up a foundation of the research by defining and summarizing related research. In the third chapter, we describe the methodology used to develop the engagement platform. All components of the concept are derived and comprehensively described in chapter four. The paper closes with a conclusion and outlines future research.

12.2 Conceptual Foundations

12.2.1 Service Systems Engineering

Service systems describe a configuration of actors and resources and their interaction (Alter, 2012) in order to enable co-creation of value by sharing resources among actors (Maglio et al., 2009). This is in line with the definition given by Böhmann et al. who conceptualize a service system as "complex socio-technical systems that enable value co-creation" (Böhmann et al., 2014). Research has recognized the emergent importance of service systems and the need for establishing further research within this field such as service science (Maglio and Spohrer, 2008, Alter, 2012). This research is supposed to address the interaction between actors regarding human agents with knowledge and skills as well as resources as technology, information, physical artifacts which interact in co-creation (Alter, 2012). Service systems engineering elaborates therefore on the importance of systematic design and development of such service systems and calls for research on evidence-based design knowledge (Böhmann et al., 2014). Service systems research consequently applies the principles of service-dominant logic which constitutes value creation through collaboration and contextualization (Vargo and Lusch, 2004). Accordingly, contextualization emphasizes that producer and consumer create value collaboratively by configuring actors and resources specifically in a context (Edvardsson et al., 2011, Vargo et al., 2008). Hence, service systems enable value co-creation through configuration of actors and resources guided by its value proposition (Vargo and Lusch, 2004). Understanding service systems as configuration of actors and resources with the aim of searching for principles and approaches that can help to improve value co-creation (Vargo and Akaka, 2012) we focus on the integration of these resources in order to foster the end-user co-creation of value within software implementation projects to realize benefits jointly.

12.2.2 Internal Crowdsourcing

Crowdsourcing is an IT-enabled phenomenon which is based on social IT like wikis, blogs or social networks (Zuchowski et al., 2016). Crowdsourcing can be defined as using information technology to connect various potential user groups to accomplished tasks by voluntary crowd workers often motivated by mutual benefits (Estellés-Arolas and González-Ladrón-De-Guevara, 2012). One main characteristic of crowdsourcing is the location of the crowd, which can be distinguished between external (e.g. communities of interest, customers) and internal (em-

ployees). External crowdsourcing has been applied in different industrial contexts as exemplified by the cases of LEGO (Schlagwein and Bjørn-Andersen, 2014) and SAP (Leimeister et al., 2009). Yet, little is known about building and engaging a crowd within organizations (Zuchowski et al., 2016). As shown by Zuchowski et al., internal crowdsourcing has characteristics which distinguish it from external crowdsourcing. For example, the crowd is comprised of employees and is thus long-term oriented rather than independent ad-hoc and short-term-oriented external crowds (Zuchowski et al., 2016). An extensive literature review stated conflicting definitions and conceptualizations of internal crowdsourcing in literature (Zuchowski et al., 2016). The authors define internal crowdsourcing as "an (a) IT-enabled (b) group activity based on an (c) open call for participation (d) in an enterprise" (Zuchowski et al., 2016). This definition is in line with an engagement platform from a service systems perspective and therefore bears the potential to support benefits realization. Another characteristic is the need for organizational culture management skills, because the approach requires an open organization where employees can collaborate and debate with each other without having cultural boundaries (Benbya and Van Alstyne, 2010). A characteristic of external crowdsourced solutions, on the other hand, is that the design has the potential to reveal 'outside the box' information, while an internal crowd may also be suitable to solve contextualized, enterprise-centered problems (Schlagwein and Bjørn-Andersen, 2014). In addition to location, the task is an important factor for distinguishing crowdsourcing approaches (Erickson, 2012). Crowds can be engaged to gain access to a diverse knowledge base as tasks vary between low levels of complexity, as considered in research on microtasking or microworking (Brabham, 2013), to tasks with increasing complexity such as ranking, sharing knowledge, ideation to design and development of new solutions. While tasks with low complexity can be crowdsourced externally to increase productivity by reducing time and costs, knowledge-intensive tasks with a high complexity will often preferably be allocated to internal crowds as only an internal crowd is fully aware of a given context.

12.3 Research Design

The research project follows a design-oriented research strategy (Hevner et al., 2004) and is conducted by utilizing the Design Science Research Methodology (Peffers et al., 2006) to systematically and iteratively design, develop as well as demonstrate and evaluate a sociotechnical artifact in a suitable context.

Therefore, the first phase Problem Identification and Motivation aims for defining the research problem and adjusting the target of the solution. This deep understanding of the problem space defines the vision of the to be designed artifact. This research project follows the problem-centered initiation as the practical relevance is shown in the introductory section as well in following chapter. Although a lack of benefits realization targeted by software implementation projects is identified current research does not address this issue. This research therefore aims at developing a concept to empower users for co-creation of improvements to enhance benefits realization after software introductions.

In the following phase objectives of a to be designed solution are derived grounded on a previous study on post-project management in large organizations and research on service systems. The next phase Design and Development utilizes these results as the foundation of the implementation. As scholars call for cumulative research in service research (Böhmann et al., 2014) as well as design research (Niederman and March, 2012, Iivari, 2015) we propose a concept as a result of the design and development phase as focus of this research. Nevertheless, as design, development, and demonstration are highly iterative phases, we include insights of the demonstration of early mock-ups and a first prototype that build the foundation of a future evaluation. This evaluation is planned to be guided by the Framework for Evaluation in Design Science (FEDS) (Venable et al., 2016). Therefore, in the planned Evaluation phase the artifact is applied in the context of a Microsoft SharePoint introduction within the case organization. Thus, a suitable context to validate its applicability and utility by solving real problems is given (Peffers et al., 2006). The results gathered throughout this evaluation likely lead to further improvements on the initial concept.

12.4 Designing Benefit Realization Supporting Components

In the following section the course of the design science research project is described that leads to the design of the benefit-supporting components. The focus hereby lies on the conceptualization in the design and development phase. Accordingly, the first two phases are only shortly described as this project seeks for a cumulative communication of the results as called for by researchers (Böhmann et al., 2014, Niederman and March, 2012, Iivari, 2015).

12.4.1 Problem Identification and Motivation

Service systems have evolved into key concepts for research in information systems (Alter, 2012, Fielt et al., 2013). Many industries such as IT manufacturing and healthcare seek to design effective technology enabled service systems that efficiently allow the configuration of the service system to meet individual needs and to create value in each context (Böhmann et al., 2014, Ostrom et al., 2015). As various studies show, a major problem of software introductions is that the resulting solutions is insufficiently used in organizations and thus, value is not created (Ward et al., 2007, 1e Limited, 2015, Semmann and Böhmann, 2015, Marchand et al., 2000). This lack of use varies from denial of use at all, users establishing workarounds to using a software but not efficiently or even effectively (Roder et al., 2016, Zainuddin and Staples, 2016, 1e Limited, 2015).

Despite this general problem description, this project is done in close cooperation with a client organization. The research takes place in a public law institution with 1.800 FTE. During an initiating workshop, the described problem was mirrored in this organization. Thus, a software introduction project was identified that fit to the described problem and has the potential to implement the to be designed concept of an engagement platform. Consequentially, the artifact aims at realizing benefits targeted by the project with a concept to empower users to co-create value within an engagement platform that integrates operant and operand resources within this service system. This is done by identifying possible improvements, discussing these, and applying the improvements collectively to realize benefits.

12.4.2 Objective of the Solution

With the overall problem definition as foundation for this design science research project, objectives of a solution must be identified. To do so, two approaches were taken. On the one hand, a preliminary qualitative study in twelve large organizations was conducted that evaluated the state of benefits management after a projects result is delivered (Semmann and Böhmann, 2015). The study reveals shortcomings of current practice that lead to implications for the design of the to be designed artifact (O1-4). On the other hand, literature on service systems engineering gives directions on the integration of resources and how actors can co-create value. Based on this research stream, a novel approach is taken that focusses on user-integration to co-create not only ideas for improving a software but also implementing the proposals by applying

deep contextual understanding of engaging users (O5,6). The resulting objectives and their related sources are subsumed in table 31.

Table 31. Objective of the proposed Solution

No.	Objective	Source
O1	Enforce continuity of benefits management that outlasts projects	(Semmann and Böhmann 2015)
O2	Accompany transition and early usage phases with an ongoing action-oriented approach instead of only a retrospective one	(Semmann and Böhmann 2015)
O3	Identify emergent benefits after the transition is completed and regular work practice is achieved	(Majchrzak et al. 2016; Semmann and Böhmann 2015)
O4	Establish ways to deal timely with improvements	(Patora-Wysocka 2016; Semmann and Böhmann 2015)
O5	Mobilize resources to enable user-driven change	(Böhmann et al. 2014a; Lusch et al. 2016; Peters et al. 2014; Storbacka et al. 2016; Vargo and Lusch 2016)
O6	Establish a platform that allows actors to engage	(Breidbach et al. 2014; Storbacka et al. 2016)

The first objective considers the dynamic during projects and afterwards that ownership of benefits is changing dynamically (O1). Therefore, an engagement platform should ensure that change proposals are consistently related to the initiator or a governing actor to be able to take on actions that support progressing with the change. Thus, distinct actors are aware of the benefits related with the change and can monitor its realization. Additionally, they have the ability to communicate the usefulness. Secondly, practical insights show that current benefits management practice is mainly retrospective in the post-project phase. Therefore, a solution needs an action-oriented approach (O2) to enable actors to improve the deployed software according to the specific needs to ensure the realization of value in context. Hence, it is not sufficient to solely collect change requests to propose follow-up projects. As users establish work routines with the introduced software (Bapuji et al., 2012), a solution should support users by identifying further unintended benefits (O3). By doing so, users can be more engaged by improving the software and contextualize it based on their specific needs. Analogously, by establishing approaches to timely implement and thus improve the introduced software (O4) users' engagement is likely to increase and as a result benefits realization increases as well. As a major challenge in service systems engineering is the mobilization and integration of resources, a solution should incorporate approaches to do so (O5). Following Breidbach et al., the solution

should have touch points that provide structural support for actors to realize the exchange and the integration of resources (Breidbach et al., 2014). Finally, a solution to enable users to improve introduced software needs to be designed as an engagement platform (O6) (Breidbach et al., 2014, Storbacka et al., 2016). Consequently, the solution should facilitate exchange between users.

12.4.3 Design and Development

To address these objectives and as the third activity of the design science research process a concept is developed with the overall aim to enable end users to contribute to adaption and customization of an introduced software. Hence, the concepts integrate mechanisms to engage all users of a software recently introduced to exchange and integrate resources to improve the software. By striving for this goal a fundamental change takes place as an internal crowd is empowered to change software utilizing a bottom-up approach. This approach leads to empowered users that can propose, interact on, and realize changes to a software. In this context, opportunities are supported, which help to mobilize and access previously untapped resources of users leading to a contextualized adaptation of the software and thus bearing the potential to improve benefits realization (Breidbach and Maglio, 2015). Doing so facilitates and empowers users to build and strengthen capabilities for implementing change initiatives using dynamic resource integration as an internal crowd. This concept shifts benefits realization from strictly formalized processes towards support in collecting experience and perception of users directly affected using the new software.

As this research takes a problem-centered approach, the design is mainly driven by the aforementioned practical and theoretical insights. Due to the strong commitment of the client organization, each iteration that lead to this concept was demonstrated and refined with practitioners. Nevertheless, the concept represents an abstraction and therefore, can comprehensively be adapted to other contexts as well.

Following the objectives, the concept for empowering users to co-create change initiatives and to enhance benefits realization in software introductions consists of three core components. A user joins the engagement platform and follows the concept in a sequence by proposing a change initiative (C1). The second component (C2) aims for gaining crowd-commitment as supporting factor for realizing the change initiative and embody validation by the internal crowd if the change initiative is worthwhile realizing. Last, the third component (C3) supports users

to realize change initiatives that are accepted by the crowd and deemed beneficial. However, the concept has an iterative character which allows re-entry in earlier components based on insights gained during the initial change initiative. Possible insights can be further change initiatives, spare change initiatives or insights which impacts the proposed change initiative.

Every component subsumes several functions that aim to transform an expected input into desired output. Subsequently, we describe the three core components of the concept in detail. We thereby focus on functions, their interfaces, cross-sectional dependencies, and design variables that need to be considered for instantiations of the concept in various service systems.

Proposing a Change Initiative (C1)

The aim of this component is to provide an engagement platform for users that enables them to collect ideas for change initiatives (Table 32). These initiatives are only emergent during the use of the introduced software in specific contexts. If for example, a process lacks accuracy during its runtime users can report immediately and contribute a change initiative for the redesign of this process. To propose a change initiative, users specify the change initiative (C1F1). This is done by describing the idea or issue (C1F2) and the related software as well as suggestions how a resolution could be realized on the engagement platform. To join the platform users should first create a user profile with information about skills and to further relate to matching change initiatives (C1F3). By using the platform, the profile will be extended with tags of interest for initiatives a user engaged with and thus represents a user's context holistically. Another mode to join the platform is to anonymously participate on the platform. This design decision must take into the effects of anonymity in communities' consideration as well as relatability of individual opinions. Table 32 subsumes the functions and highlights design decisions made in the organizational context of the project.

Table 32. Overview Component C1: Proposing Change Initiative

Objective	O1, O2, O3
Input	idea statement, improvement proposal, solution design
Functions	Design Variables
(C1F1) initialize change initiative	**idea, solution, problem**
(C1F2) describe change initiative	free text, **defined template**
(C1F3) create user profile	anonymous, **single-sign-on**, new profile
Output	well formulated change initiative

Gaining Crowd-Commitment (C2)

The overall aim of this module is to gain crowd-commitment for a proposed change initiative. Thus, users are supposed to engage to co-create suggestions and possible solution designs. Accordingly, one purpose of this component is to build communities of interests. To participate in such a community modes of crowdsourcing can be distinguished in general between the modes 'wisdom of the crowd' and 'marketplace/contest' (Vukovic and Bartolini, 2010). With the aim of improving usage of software and with the boundary condition of limited members in the user base it is not suitable to compete against each other. Moreover, the overall aim is to work collaboratively on a solution to an identified problem. This is in line with the guiding definition of internal crowdsourcing which declare an 'open call for participation' (Zuchowski et al., 2016). Therefore, the concept should provide opportunities to discover change initiatives (C2F1). This can be instantiated using search and filter functions for new and relevant change initiatives. A more proactive and dynamic way to discover change initiatives is by demonstrating success stories related to user profiles by recommender engines.

Providing feedback for change initiative, developing suggestions and solutions (C2F2, C2F3) as well as rating change initiatives (C2F4) requires engagement between actors (C2F5). To prioritize change initiatives rating mechanisms can be implemented inspired by funding, voting and rating mechanisms. Based on the feedback and a prioritization change initiatives are selected which have particularly high and relevant benefits for software usage. To address a broad range of users, groups of interests and departments these functions must be provided across the organization to give all users the opportunity to participate as well as to involve users (C2F6). Therefore, communication such as blogs or forums are needed. Additionally, opportunities to address single users explicitly with sharing functions or with tagging systems that may suggest potential experts are needed to support communicating change initiatives and to engage users. A web-based information system which provides users a communication infrastructure is needed to allow them to share change initiatives, feedback, design discussions and helping to build solver groups. The participation of users will be strengthened in this way and they can contribute their expertise to provide improvements for a wider range of users. Gaining crowd-commitment does not only aim for gathering feedback for a change initiative but moreover to build a realization team to solve the issue and implement the developed solution design (C2F7). In this regard a user volunteers as a solver and thus teams up with the requestor and other

committed users. This (virtual) formation can be supported for example by expertise matching tag systems as well as direct addressing potential solvers.

Table 33. Overview Component C2: Gaining Crowd-Commitment

Objective	O2, O4, O5, O6	
Input	change initiative	
Functions		Design Variables
(C2F1) discovering change initiative		**search function**, **success stories**, recommendations, **filter function**
(C2F2) feedback change initiative		**blog**, forum, instant messaging
(C2F3) develop suggestions and solutions		**free text**, mock-ups
(C2F4) rate change initiative		funding, rating, **voting**
(C2F5) communicating change initiative		**passive**, **active**
(C2F6) involve users, experts		**tagging**, mail, newsletter
(C2F7) building solver-team		**self-organized**, direct communication
(C2F8) govern crowd		**self-regulating**, passive controlling, community-manager
(C2F9) monitoring status change initiative		promote, remove, **provide status**
Output	(virtual) team formation, refined and validated solution design	

Further mechanisms should be considered that adopt functions of managing the crowd. For example, in the case of inadequate comments guidance how to govern the crowd are required (C2F8). This might imply the need for community management as well as reporting mechanism. Additionally, by monitoring the status of a change initiative and information about recent activities, community management can actively promote or remove outdated change initiatives (C2F9). The hurdle lies in the activation of users to engage on the platform, discovering change initiatives and to participate with feedback, rating as well as solving change initiatives. Guided by the demand to design an "engagement platform to incentivize certain actors to contribute their resources and enable service-for-service exchange" (Storbacka et al., 2016), corresponding motivation, activation and incentive mechanism for users have to be established. Therefore, motivation and incentives can be distinguished between the source of incentive (intrinsic, extrinsic) and the object (monetary, non-monetary) (Przygodda, 2005) and should be embedded in the instantiation of the concept (Cuel et al., 2011). However, the willingness and openness to participate on the engagement platform may be restricted by social influences. By designing communication, coordination, motivation and incentive guidelines the boundaries of individual decision making within an organization and closed communities should be considered. Actors act within a structure restricted by social rules and collective meanings, which are part of the

organizational culture (Lusch and Nambisan, 2015). This is mirrored as well in the overview given in table 33 including the design decisions in the case organization.

Realizing Change (C3)

As the overall aim of the concept is to realize change initiatives. As organizational context also embodies limited time for additional activities and lack of access permissions, change initiatives will be implemented jointly by the crowd and transferred to regular operation (C3F1). By providing dedicated time for users or adding additional resources users are empowered to realize benefits for themselves and for other users (C3F2). It is also possible that projects arise, which are equipped additionally with budgets and possibly additional resources and handed over to general project management. Other ways to support realization of change initiatives are crowd mechanism (C3F3) such as task management (Dwarakanath et al., 2015). Building tasks to split workload and provide the possibility for lightweight participation in the realization process. Further dividing realization projects into small tasks supports automated testing and automatic integration (Dwarakanath et al., 2015). After users have realized a change initiative, the solution should be tested and evaluated regarding defined acceptance criteria (C3F4). This also depends on the context and thus needs to be defined during instantiation of the engagement platform. After realizing and deploying change initiatives engaged users are informed and rewarded as defined during instantiation of the engagement platform (C3F5).

Table 34. Overview Component C3: Realizing Change

Objective	O2, O4, O5	
Input	solution design	
Functions		Design Variables
(C3F1) realizing change initiative		
(C3F2) enable realization		**attracting experts/consultants/IT**, providing dedicated time
(C3F3) building, assigning tasks		**self-regulated**, supported by tools, only if no additional tools are needed
(C3F4) testing and evaluating change initiative		how (**not mandatory**, acceptance criteria), who (IT department, **user**)
(C3F5) reward participants		monetary, **non-monetary**
Output	realized, deployed change initiative, realized benefits	

12.4.4 Demonstration of a Preliminary Instantiation

The conceptual results of each design and development cycle were already initiated as proto-

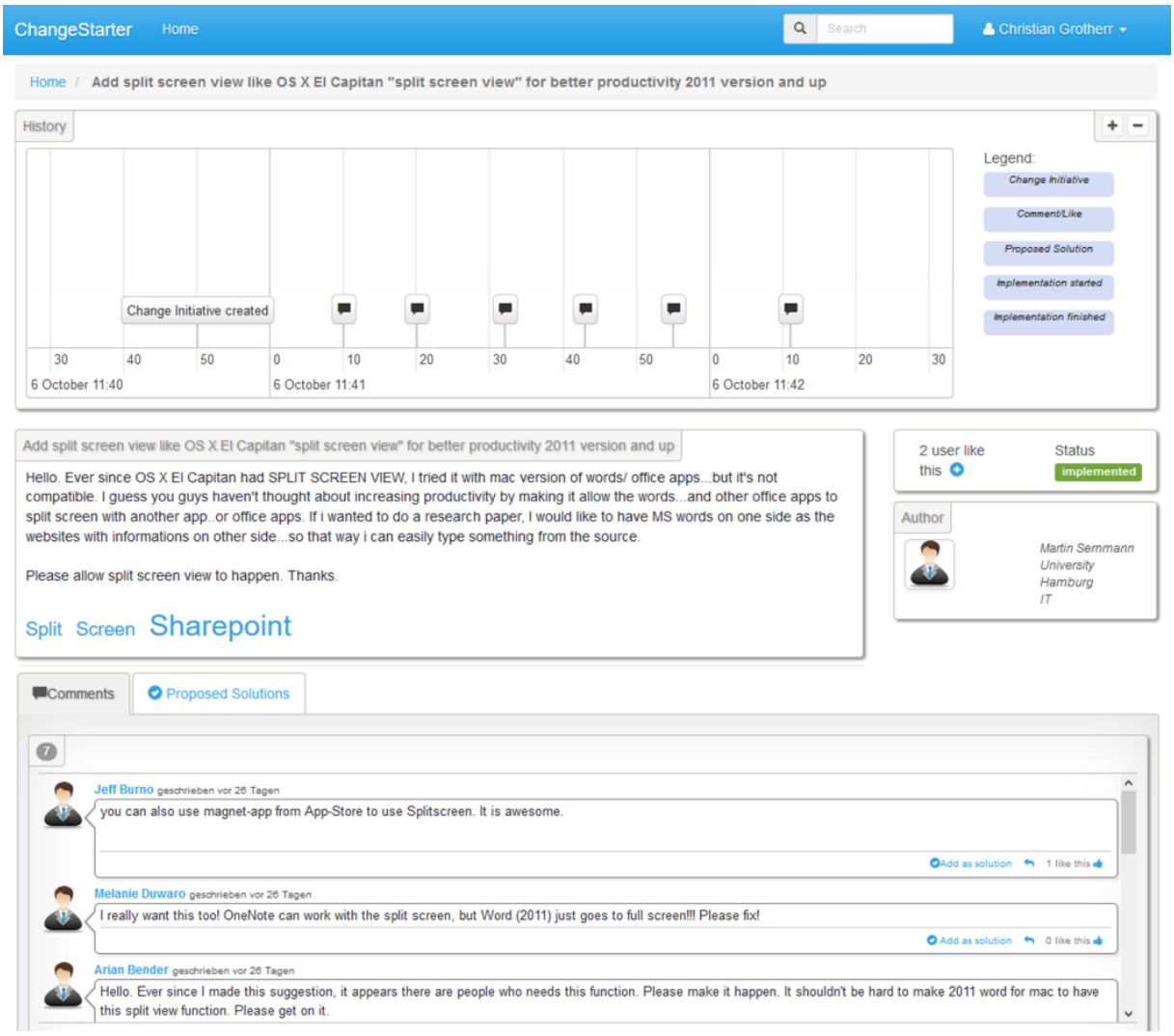

Figure 12. Instantiated User Engagement Platform supporting Benefits Realization

types and demonstrated within the case company. Starting with a reduced prototype the demonstration of the components and their functionality was initially conducted with a low-fidelity prototype (mock-ups). By extending the concept incrementally based on the preliminary results of the demonstration, the overall concept was instantiated as a responsive web application based on open source frameworks as shown in figure 12.

In sum, five workshops were conducted lasting two hours each including highly relevant stakeholders such as the CIO, head of IT operations, senior managers, representatives of the workers' council, and privacy commissioner to gain strong commitment of management as well as workforce.

Within the demonstration phase, feedback was gathered regarding the set of design variables and their manifestation to meet the requirements of the organization like the condition of voluntary and autonomous participation on the engagement platform. The results are highlighted in table 32 to 34. Additionally, further extensions and improvements of features were discussed. For example, features were added to support discovering change initiatives (C2F1) like search functions and success stories. Despite this, every workshop helped streamlining the overall usability by simplifying the user interface to decrease adaption barriers.

12.4.5 Evaluation

As the first completed demonstration of the concept and its instantiation was successful, an extensive evaluation is currently planned. This evaluation is will be operationalized at the case organization and is open to all employees. Based on the gained commitment of relevant stakeholders during demonstration phase, we can deploy the prototype within the systems of the client and ensure deliberately low participation. Moreover, the evaluation does not have a dedicated timeframe and thus the internal crowd of the organization can evolve over time. The goal is to include 100 FTEs during the first phase of the evaluation. To achieve this goal, a set of potentially interested users is identified that could act as promotors for the concept within the organization. These users also serve as pre-tester to populate the platform with initial initiatives.

By evaluating the artifact within the organization, feedback is gathered applying qualitative methods such as interviews or thinking aloud to get insights on user's perception (Boren and Ramey, 2000, Myers, 2013) as well as gathering usage data. Accordingly, we do not only focus on the technical evaluation but also seek to gain insights on the social consequences of the artifact. Thus, the evaluation will contribute to the ongoing debate on socio-technical artifacts (Silver and Markus, 2013, Goldkuhl, 2013). The experiences and results of the evaluation are directly incorporated into further development and refinement of the concept.

12.5 Conclusion

Striving for a rise of benefits realization after a software introduction is formally closed, we presented a novel concept of an engagement platform. This concept utilizes a service systems perspective to empower users by a bottom-up approach to propose, engage and discuss and finally implement changes for this software and work routines. By doing so, the entirety of

users can improve sociotechnical interaction to enhance the creation of value in context. Consequently, users are empowered to realize benefits that could not sufficiently be addressed during the software introduction project but even more, can deal with emergent benefits collectively. As the design of the concept integrates practice-oriented as well as theoretical insights within a case organization to instantiate the concept, in depth knowledge on the integration of resources in a complex service system as well as engagement strategies can be gained. Thus, this research is a core foundation towards an evaluation that is evidence-based and bears the potential to further improve design knowledge on actor-centered service systems engineering. Additionally, the proposed concept relates to current research on benefits management that seeks to understand how benefits realization can be fostered on actor level.

As a next step, the concept will be evaluated in practice within the introduction of Microsoft SharePoint. Moreover, it is planned to apply the concept to other contexts to assess and further enhance the transferability. Especially, regarding the design variables we seek to identify beneficial combinations to strengthen the engagement of users and thus contribute to the still emerging research on actor engagement in service systems.

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14 Appendix A: Designing Benefits Realization – Deconstruction of Post-Project Benefits Management Practice

Semmann, M., and Böhmann, T. 2018. "Deconstruction of Post-Project Benefits Management Practice: Deriving Design Principles to Foster Contextual Benefits Realization," Multikonferenz Wirtschaftsinformatik (MKWI) (25), Lüneburg, Germany. [under 1st revision]

Abstract

The concept of value is central to service science, nevertheless, its realization still needs to be better understood. Specifically, regarding IS projects deeper understanding of practice and the application of scholarly insights remains challenging. Thus, the understanding IS projects and the application of its results as a service system that embodies value co-creation is promising. In this regard realizing benefits lead to co-creation of value in context and thus helps to bridge the gap of contextualized insight in IS projects to value in context. As practice proves, existing scholarly effort is only partially utilized in organizations. Thus, benefits realization still falls short of expectations and limits the facilitation of value in context. By deriving design principles based on organizational practice and service systems research, an actionable frame is given to foster benefits realization in organizations and contribute to the understanding of value in context and resource integration in service systems.

Keywords

Service Systems Engineering, Value in Context, Benefits Management, Design Science Research

14.1 Introduction

As the concept of value is central to service science, its ultimate realization still needs better understanding [1, 2]. Specifically, regarding IS projects deeper understanding of practice and how scholarly endeavors can be applied is a key challenge. Thus, the perspective on IS projects as knowledge-intense, actor-oriented service systems that embody the creation of value in context as an overall goal is worthwhile dealing with. Even more, as value in context broadens the perspective towards project and post-project phase that encompass utilization of results. In this regard realizing benefits leads to co-creation of value in context and thus helps to bridge the gap of contextualized insight in IS projects to value in context. Nevertheless, as recent studies substantiate, post-project benefits management is still not mandatory for project management and especially IS projects [3, 4]. Moreover, practice has proven that existing scholarly effort is scarcely utilized in organizations. Thus, benefits realization still falls short of expectations and limits the facilitation of value in context. To elaborate on this issue, we develop design principles for post-project benefits management based on a qualitative study published previously [blinded]. The results show heterogeneous approaches that are only implicitly inspired by benefits management literature. While the previous publication focused on the identification and derivation of general implications, this paper takes this further. Thus, we analyze the approaches applied in organizations to gain insights on priorities, abilities, and core intentions regarding benefits realization. Additionally, we applied a service systems perspective on the approaches to facilitate the concept of value in context. By doing so, the focus of post-project benefits realization is broadened towards the operant and operand resources integrated ins specific contexts. This adds value to benefits management as a main barrier of benefits realization is the bias towards the realization of IS projects. Service Science thus helps to emphasize the facilitation of a project result in actor-specific contexts. Based on these insight, we propose 6 design principles that enable researchers to design artifacts that are grounded in organizational practice and explicitly foster benefits realization. Practitioners can use the principles to assess their own post-project benefits management approaches and apply them to improve benefits realization.

The remainder is structured as follows: Theoretical foundations on service systems and benefits management are given. Following the description of the research design that is further utilized to derive the design principles. Then the results of the study are introduced with a focus on post-project benefit management approaches applied. Those approaches are deconstructed to identify core intentions followed by organizations. Given this basis, six design principles are derived

that can lead future development to improve benefits realization by instantiating a service system to facilitate value. The paper closes with a discussion of the results and a conclusion.

14.2 Theoretical Foundation

14.2.1 Service Systems Engineering

Service systems describe a configuration of actors and resources and their interaction [5] in order to enable co-creation of value by sharing and integrating resources among actors [6]. This is in line with the definition of a service system as "complex socio-technical systems that enable value co-creation" [7, p. 73]. The emergent importance of service systems and the need for establishing further research is recognized by scholars within service science [5]. It is supposed to address interactions between actors regarding human agents with knowledge and skills as well as resources as technology, information, physical artifacts which interact in co-creation [5]. Service systems engineering elaborates on the importance of design and development of such service systems and calls for research on evidence-based design knowledge [7, 8]. Service systems research applies the principles of service-dominant logic which constitutes value creation through collaboration and contextualization [9]. Despite the notion of value-in-use, value-in-context is deemed as a path for evolvement of service-dominant logic that represents the locus of value creation in relation to the involved actors more sufficiently [1, 2, 10]. As value occurs by utilizing of a service, the value thus depends on the situational context. Accordingly, contextualization emphasizes joint value creation by configuring actors and resources in a specific context [1, 2, 11]. Hence, value co-creation is enabled by service systems through configuration of actors and resources guided by its value proposition [9]. Within this paper, IT projects and the application of projects' results in organizations are understood as service systems as they are knowledge-intense and actor-centric [12].

14.2.2 Benefits Management

Benefits management gained broader scholarly attention during the mid-1990s [13]. In this study the term benefits management is defined as „the process of organizing and managing such that potential benefits arising from the use of IT are actually realized" [13, p. 214]. This definition contains the fact that there is a significant time lag between the development of a solution and the realization of benefits by using the solution [14-17]. Another result of this initial study the Cranfield Benefits Management Model was derived. It is well accepted and foundation for

various research approaches on benefits management [13, 18, 19]. It consists of five phases and seeks to establish an ongoing identification and realization of benefits throughout projects without explicitly addressing the post-project phase. In addition, other suggestions were developed for realizing benefits of IS projects in the post-project phase that address the time lag after adoption to benefits realization. These approaches emphasize the realization of planned benefits by changing organizational work practices [19-23]. Most of these approaches suggest tracking benefits realization according to predefined measures, e.g. through conducting a post-project benefits review [23],an ongoing management of planned benefits by linking it to general performance management functions [23], or establishing ownership for continued benefits exploitation [19]. Despite these scholarly efforts, the application of benefits management remained insufficient and lead to more practitioner-driven approaches [21, 23-25]. All in all, the diffusion of a formalized benefits management is still slow [3, 4]. In a literature review on benefits management from a project perspective [26] one reason becomes visible. The study shows that in post-project phases there is no method or concept established to support emerging benefits as well as identified but unrealized benefits. This is contradictory to empirical evidence that suggests that organizational change has an emerging character [14, 17, 27]. Furthermore, few research in the area of benefits management addresses this shortcoming [28]. Relating to this lack of methodological support, the concept of value in context helps to fill in this gap as the lack of individual context can be seen as a key barrier in benefits management [29]. By utilizing a service perspective, the focus shifts from IS projects towards the actual usage phase of a projects results. Thus, the aim for post-project benefits management builds on benefits-related activities before and during the project but seeks to strengthen the contextualization of the output of IS projects by engaging actors and resources embedded in the usage phase.

14.3 Research Design

The aim of this research is to deconstruct current practice in post-project benefits management and deriving design principles. Corporate benefit management practices are derived that integrate a service systems perspective to enhance the applicability of results, as current approaches do not bridge the gap between research and practice. To be able to design artifacts, this understanding of current practice is deconstructed to derive design guidelines that take the organizational context in account [30]. Additionally, this approach is in line with calls for evidence-based and cumulative research in design science and service science [7, 8, 31]

In the eleven interviews, we investigated from an organization-wide angle to guarantee an encompassing view on each organization and the utilized approaches. We conducted semi-structured interviews to gain insights into current practice of benefits management in large organizations [32, 33]. Our guideline encompassed the project, post-project phase, and research on benefits management. The guidelines were pre-tested with six experts in a workshop and resulted in seven blocks of thematically focused open questions to facilitate the interviewees to refer to their individual organizational context. Each interview lasted 60 to 90 minutes and was conducted by up to four researchers. The interviewees were top-level managers with a strong background in IT and business. The interviewees were selected by availability and general opportunity. All interviewees have had long-term experience in project management and have taken responsibility for at least a large part of their corporate IT. The resulting data was analyzed by utilizing the qualitative content analysis by two independent researchers [34, 35]. Therefore, codes were deductively derived according to the interview guideline. After the analysis of the first five interviews the codes were inductively revised to incorporate first findings and implications. The results of the coding were stable. First results on the use of the following approaches and more detailed information on these implications of the diverse methods in research and practice are previously published [blinded]. Based on these results core intentions are derived within this paper to combine these with scientific insight to propose beneficial design principles.

14.4 Benefit Management and their Deconstruction

The study indicates that awareness for benefits management exist in organizations and each case company tackles it with different approaches. Especially, the chartering phase is well understood and supported methodologically [3, 20]. Each company uses business cases to propose projects and most of them have a structured portfolio management process to manage various programs and projects to align them to the organizational strategy [blinded]. In the post-project phase, the utilization of approaches is more heterogeneous and patchy. Based on the insights gained by conducting the study, the following section describes approaches taken to realize benefits and highlights the underlying core intentions (CI) that build the foundation of the actions taken. A systematic overview of all identified approaches, their general purpose, and the core intentions of the approaches is given in table 35.

Agile Methods: Four interviewees stated that agile methods are utilized to align changing business needs with a project (CI 1). Thus, users are involved in short cycles of interaction (CI 2) throughout the lifecycle of a project to ensure that requirements are met and benefits realization is fostered [36]. Regarding the concept of value in context, this approach fosters an understanding of operant resources and their integration within an IS project to ensure value creation in the usage phase.

Table 35. Overview of identified approaches, their purpose, and their core intentions

Approach	General Purpose	Core Intention
Agile Methods (Project)	Dynamic alignment of business needs and project.	CI 1: Alignment to business needs CI 2: Involvement of a projects´ beneficiaries CI 3: Gain better understanding of work practice to improve solution fit CI 4: Dealing with dynamic organizational and external circumstances
Project Assurance (Project)	Independent identification and monitoring of risks.	Ci 5: Assessment and Monitoring of risks regarding benefits CI 6: Gain awareness for risks
Project Hand Over (Post-Project)	Explication of shortcomings and need for further actions.	CI 6: Gain awareness for risks CI 7: Building foundation for follow-up actions CI 8: Improve future practice
Post Mortem (Post-Project)	Formalized interface to transfer project results to business units.	CI 2: Involvement of a projects´ beneficiaries CI 6: Gain awareness for risks CI 8: Improve future practice
Benefit Collection (Post-Project)	Strict collection of benefits according to appraisal.	CI 2: Involvement of a projects´ beneficiaries CI 8: Improve future practice
Benefit Report (Post-Project)	Reflect on project performance and sustain lessons learned.	CI 6: Gain awareness for risks CI 8: Improve future practice
Demand Mgmt. (Both)	Ongoing mgmt. and transformation of business needs to projects.	CI 1: Alignment to business needs CI 2: Involvement of a projects´ beneficiaries CI 4: Dealing with dynamic organizational and external circumstances
Competence Center (Both)	Gain subject-specific insight to embrace beneficial development.	CI 7: Building foundation for follow-up actions CI 8: Improve future practice

Additionally, the close involvement enables an improved solution fit by gained understanding of users work practice (CI 3). Even more, dynamic organizational and external change (CI 4) can be addressed by agile methods to integrate changing circumstances. Unintended or unexpected benefits can be continuously identified and the project team can deal with them to realize benefits. Project Assurance: A unique approach of one interviewees organization is the project assurance group. This organizational unit has a mediating role in large projects. The project assurance group attends all steering committee meetings and is responsible for recording all

decisions. Moreover, this group directly reports to the CIO and independently assesses the risks of the observed project (CI 5). By doing so, risks gain more awareness in the committee (CI 6). One aspect of this ongoing auditing is related to risks to fail benefit realization. Thus, this approach helps to monitor benefits throughout projects. Based on the independent status of the group, it encompasses a mediating role for the project management and thus, can help to ensure successful projects to imply organizational change. Project Hand Over: One interviewee is aware of the disadvantages of changing responsibilities throughout the project and post-project phase. As a response to this issue the organization established project hand over meetings to engage future leaders. The meetings are between recent and future leader of the project or the responsible manager of the business unit after shakedown and project closure. During this meeting, shortcomings of a solution are explicitly addressed and even further potential for improvement highlighted (CI 7). This open and honest communication helped the organization to deal with changing circumstances and raising awareness for unresolved problems during a project (CI 6). The mindset of this approach is to adjust expectations on projects results, taking on further actions to improve the results, and to improve future practice (CI 8). Post Mortem: Project post mortems seek to formalize the interface between project lead and the benefiting business unit (CI 2). This approach helps to sustain knowledge about the curse of a project and risks regarding the realization of benefits (CI 6). It thus, enforces to state the final status of a project and potential deficits. The study shows that this approach is solely retrospect and does not contain further implications to deal with the reported deficits. Therefore, the post mortem is an instrument for the organization to learn from closed projects (CI 8). Benefit Collection: Two interviewees stated that benefits are strictly collected according to the preliminary business case of a project. By this approach the organizations are driven to measure the performance after the project is closed against predefined targets. This delivers a validated estimate of the business impact of a project (CI 2). Thus, strict collection forces organizations to improve their practice (CI 8) due to the consequences of overestimated effects in business cases. This approach is partially problematic due to changes to the organizational environment during the runtime of projects. Especially, larger organizations tend to have parallel projects addressing similar benefits and thus accountability is difficult to assign. Benefit Report: Three companies incorporate benefit reports to reflect on closed projects. All cases focus on timelines, adequate coverage of functional requirements, and budget adherence. Additionally, the report aims to monitor the results and the realization of benefits for users in their context. Consequently, this assessment

can help organizations to get aware of risks throughout the lifecycle of projects (CI 6). Commonly, those reports are done three to six months after the formal closure of a project. In rare cases without a formal decision, benefits reports are done after more than twelve months and thus giving the company time to adapt to the projects results. As the interviewees stated, the reports lack a strict metric to assess the realization of benefits and are primarily used to sustain lessons learned (CI 8). Demand Management: A case company established a demand management process to manage long-term business needs and to derive projects according to those needs (CI 1/CI 2). Additionally, throughout the process benefits are handled and unintended emergent benefits can be identified and included in current projects. This creates the opportunity to realize new benefits while projects advance. Even if a project is closed, emerging benefits can be assigned to other running projects due to the understanding of the business in conjunction with the overview on all projects (CI 4). Competence Center: An interviewee´s organization established several competence centers to generate subject-specific novel ideas. The goal is to consider recent demand, anticipate its future development, and manage demand to support business units as well as enabling new businesses within the organization. Due to the subject-specificity, the organization gains expertise in this area over time to improve future practice (CI 8) and the possibility to establish foundations for follow-up actions (CI 7).

14.5 Design Principles for Contextual Post-Project Benefits Management

Grounded on the analysis of approaches taken in organizations to realize benefits and the underlying core intentions the following section describes derived design principles that guide organizations to develop approaches to facilitate value in context by post-project benefits management. Additionally, these principles can lead further research in this area to assure that benefits management retains its high perceived relevance, but gains more methodological foundation and application in practice. By exploring the approaches utilized in the studied companies, core intentions were derived. These intentions subsume the underlying assumptions organizations impute. Thus, these intentions represent the most prioritized requirements from a practice-oriented perspective on post-project benefits management. To derive design principles for the structured development of artifacts this foundation is beneficial due to the practical validity in the context of the case organizations [37-39]. Each design principle is directly derived by core intentions with the aim for an applicable guideline that seeks to be encompassing for post-project benefits management (Table 36).

Design principle 1 (DP 1) broadens the perspective of user integration beyond the chartering and project phase throughout the lifecycle. By doing so, an alignment to business needs is fostered (CI 1), beneficiaries are integrated continuously (CI 2) and their work practice is better understood (CI 3), and organizations are able to gain expertise on users' needs to improve future practices (CI 8). Consequently, by engaging users throughout the lifecycle of projects, change is incorporated more easily and the user's ability to integrate operant and operant resources to create value is strengthened [7, 40-42]. Design principle 2 (DP 2) suggests validating the alignment of a solution with the business needs as well as organizational and external circumstances regularly (CI 1). This avoids solutions that are misleading in dynamic environments (CI 4). By establishing such an iterative validation, processes can be fostered that ensure engagement of relevant stakeholders [4, 28].

Table 36. Relation of design principles, fundamental core intentions, and supporting evidence.

Design Principle		**Core Intention**	**Supporting Evidence**
DP 1	Integrate users throughout the whole lifecycle	1, 2, 3, 8	[4, 7, 40-42]
DP 2	Revalidate alignment with business needs and circumstances regularly	1, 4	[4, 28]
DP 3	Assess, monitor, and manage risks regarding benefits realization	5, 6, 8	[4]
DP 4	Constantly identify improvements, adaptations and needs with an action-oriented approach	1, 2, 3, 4, 7, 8	[4, 7, 29, 41, 43]
DP 5	Enforce continuity regarding responsibilities for benefits that outlasts the project	1, 2, 3, 4	[4, 28]
DP 6	Foster realization of anticipated benefits by creating opportunities for actors to perform	2, 3, 7, 8	[4, 29, 41, 42, 44]

Design principle 3 (DP 3) focuses on continuous assessment, monitoring and management of benefits-related risks. Thus, materializing risks can be managed (CI 5) and all relevant stakeholders are aware of these risks and their potential consequences (CI 6). Moreover, the organization can improve the assessment and management of risks over time (CI 8). Thus, consistently raising awareness for benefits and benefit-related risks [4]. The design principle 4 (DP 4) advises to continuously use action-oriented approaches to identify potential improvements, adaptations of a solution and needs constantly to deal with emergent benefits und unrealized but anticipated benefits. Thus, actors can improve a projects solution based on their work practice and knowledge about the service system [4, 29, 43]. Consequently, leading to an improved value creation in the given context [7, 41]. By doing so, users as well as business needs are

taken into consideration (CI 1, 2, 4) and better understood (CI 3) and even more follow-up actions can be defined (CI 7). Design principle 5 (DP 5) fosters continuity in responsibility for benefits that should outlast the project lifecycle [4, 28]. This helps to broaden the understanding of the work environment of users (CP 3) and dynamics in this environment (CI 4). Even more, if the responsibility is located in the beneficiaries' business unit (CI 2), benefits realization can be fostered due to the strong alignment with business needs (CI 1). Lastly, the design principle 6 (DP 6) strives for the creation of opportunities to perform for beneficiaries to explicitly foster the realization of benefits. Doing so, users can be systematically involved (CI 2) and their work environment can be better understood (CI 3). Moreover, by utilizing this principle the foundation for further follow-up actions can be created (CI 7) and thus help to further develop a solution and to increase benefits realization, ultimately leading to increased value in context [4, 29, 41, 42, 44].

14.6 Discussion

As the results of the qualitative study show, practitioners acknowledge the need for improved realization of benefits resulting from IS projects. Despite this consensus on the issue, there are hardly any harmonized approaches throughout the sample. Besides business cases and portfolio management processes that only indirectly help to realize benefits, only agile methods are getting raised attention with a partial focus on benefits as enabler of value in context in four organizations. Considering the raised awareness and penetration of project management with agile methods, it seems that improved benefits realization is a positive side-effect of this recent trend. After the project phase, the approaches applied are even patchier thus, all organizations utilize approaches in shakedown or benefit capture phase. Nevertheless, all are mainly retrospective and seek to support organizational learning. Benefits realization is only partially tackled which is in line with prior studies [3, 4]. To bridge this gap, the application of a service systems perspective seems beneficial as unrealized benefits result in insufficient creation of value in complex sociotechnical environments. By applying a service perspective, the integration of multiple actors and resources for the sake of the beneficiary is acknowledged [8]. Thus, the need to integrate the beneficiary is fundamental for benefits realization. This is not consistently mirrored in benefits management literature, as it focuses on projects and only incidental the beneficiaries [21, 26, 45, 46].

By analyzing the underlying benefit-related core intentions of all approaches identified in practice, it is possible to gain insights in the priorities and existing or needed abilities of organizations. This analysis indicates the levers organizations have identified to improve benefits realization and were willing to extend the applied methods for managing projects by these approaches. Thus, by addressing these core intentions, organizations commit labor, time, and budget which emphasizes the relevance and impact of benefits management in the shakedown and benefit capture phase. Moreover, it is striking that current intentions heavily rely on the alignment of business needs and users in their context with the solution (CI 1-4) and on organizational learning for future projects (CI 6-8). Notably, CI 5 differs due to its focus on management of current risks in the project and partially in the shakedown phase. This intention is solely implemented in the project assurance approach. A reason for this focus can be seen in the history as a former public authority and still present strong bureaucratic structures and risk-averse corporate culture. Another remarkable finding is that solely CI 7 represents an action-oriented and future-oriented intention. Consequently, this intention takes users, their skills and experiences serious and implicitly imputes that within a given work environment actors integrate resources differently and by doing so results of IS projects cannot deliver a solution that fits to all possible contextualization. Consequently, value creation is deemed context-specific and therefore needs to be seriously tackled within the usage phase. In general, organizations emphasize on retrospective assessment of projects. A reason could be that organizations imply well-defined projects and the resolution of all problems after formal closure of projects.

The design principles as derivation of these core intentions represent these findings despite empirical evidence that the realization of benefits materialize with time lag. As the intention of the design principles is to represent approaches on post-project benefits management applied by organizations, the result is valid. Nevertheless, we strongly argue to shift the focus towards action-oriented, future-oriented approaches as represented in design principle four and six. This is also mirrored in the service science, as value is co-created and occurs by using a projects' result in a specific context [8].

Our interpretation of the retrospective-driven approaches is the problem of lack of continuity in responsibility. Due to changes in responsibility during the project and after shakedown, sustaining benefits in focus and foster their realization is a difficult endeavor. Especially, if the beneficiary of a solution is not integrated or committed to a project. This issue is explicitly addressed by design principle five and in interplay with the other design principles, resulting

artifacts potentially resolve this issue and therefore, enable organizations to switch from retrospect benefits realization approaches to action-oriented and future-oriented approaches that avail the potential of realizing value in context. From a service systems engineering perspective, the analysis of organizational practice within the framing of IT projects contributes evidence-based insights in service systems. Thus, adding to the understanding how such sociotechnical systems operate, how issues on the integration of resources are managed or not perceived in practice, and how changes in the context of service systems influence the realization of value in context.

14.7 Conclusion

Scholars have addressed benefits management and the realization of benefits in the last decades. Nevertheless, those efforts did not lead to significantly improved benefits realization in practice. Even more, scientific insights have hardly been transferred into practice [3, 4]. As we showed, a service system perspective has the potential to bridge this gap by emphasizing the context in which benefits are realized, leading to the concept of value in context. To further investigate the lack of benefit realization, we build on a qualitative explorative study to identify approaches of benefits management in practice [blinded]. The results show that a wide variety of these approaches with heterogeneous dissemination and purpose can be found. Reflecting on these purposes, we derived core intentions that the approaches are based on. Doing so, ensures a reasonable understanding of what is prioritized in practice and seen as worthwhile implementing regarding post-project benefits management. In a next step, six design principles for benefits realization are defined. These principles reflect essential needs of organizations and service systems research. Thus, give guidance for the development of post-project benefit management approaches. Moreover, they give a comprehensive overview of the fragmented methodological support throughout shakedown and benefit capture phase. These can be used as foundation for developing novel artifacts that foster the realization of benefits after the formal closure of a project. Even more, the guidelines enable the design of artifacts to instantiate service systems as after a project with the aim to foster and support the facilitation of value in context. Beyond this, the design principles help practitioners to assess their organizations priorities and implement instantiations of approaches that fit their purpose. Additionally, the results present insights on how the service system IS project is applied in practice and how value is created. Regarding the acknowledgement of the creation of value as a joint activity that heavily depends on the context, the results show, that better understanding of the interplay in changing environments

can be orchestrated to support resource integration is needed. Thus, the design principles derived contribute to this gap.

Future research should seek to align benefit management models with the six practice-based design principles to enable organizations to explicitly manage benefits realization after the project phase. This alignment should also explicitly address the differences between scientific approaches and practical ones to lever insights to practice in an applicable way. As shown, service research is a promising perspective to face this gap. Moreover, the design principles lead to the possibility to develop artifacts that help practice improving their benefit realization capabilities. This also can validate the design principles in other contexts. Lastly, after validating the results in different cases, this research can lead to a design theory on benefits realization in service systems.

14.8 References

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15 Appendix B: Declaration on oath / Eidesstattliche Versicherung

Hiermit erkläre ich,

Martin Semmann, geboren am 06. März 1985,

an Eides statt, dass ich die vorliegende Dissertationsschrift

„Service Systems for Benefits Realization“

selbst verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe.

I hereby declare, on oath, that I have written the present dissertation by my own and have not used other than the acknowledged resources and aids.

Hamburg, den 29.09.2017 _____

City, Date Signature