Analysis and Design of Service Business Models

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Zusammenfassung

Problemstellung und Zielsetzung der Arbeit

Dienstleistungen haben eine enorme Bedeutung für zahlreiche Volkswirtschaften. Im Jahr 2012 waren in Deutschland mehr als 73% der Bevölkerung im Dienstleistungssektor beschäftigt (The Federal Statistical Office 2014). Ein Grund für die hohe Zahl der Erwerbstätigen in diesem Sektor ist die starke Heterogenität von Dienstleistungen. So existieren Dienstleistungen, die von einem einfachen Haarschnitt bis hin zu hoch komplexen Dienstleistungen in der Informationstechnik reichen.

Der steigende Wettbewerb in vielen Branchen, die Weiterentwicklung von Technologien und attraktive Marktpotenziale führen weiterhin dazu, dass die Unternehmensentwicklung mit Hilfe von Dienstleistungen eines der Schlüsselziele und eine substanzielle Herausforderung für viele Unternehmen darstellt (Eggert et al. 2014). Dies begünstigt die Entwicklung von innovativen service-orientierten Geschäftsmodellen (Buhl et al. 2008; Neu & Brown 2008).

Die Entwicklung von service-orientierten Geschäftsmodellen führt zu weitreichenden Veränderungen in der Geschäftslogik vieler Unternehmen. Dadurch werden interdisziplinäre Ansätze notwendig (Buhl et al. 2008), die die Wertschöpfung aus einer Servicelogik heraus betrachten (Grönroos 2006; Vargo & Lusch 2008; Grönroos & Ravald 2011). Generell unterstreichen diese Veränderungen die Bedeutung des Kunden im Wertschöpfungsprozess und fordern den Wandel von einer produktzentrierten zu einer kundenzentrierten Denkweise (Prahalad & Ramaswamy 2000; Gouthier & Schmid 2003).

Inspiriert durch diesen Wandel erhielten service-orientierte Geschäftsmodelle eine zunehmende Bedeutung in der Geschäftsmodellforschung (Chesbrough & Spohrer 2006; Zott et al. 2011; Fielt 2012). Im Kontrast zu traditionellen Innovationen, die meist die Entwicklung von neuen Produkten oder traditioneller Forschung und Entwicklung umfassen (Sawhney et al. 2006), führt eine kundenzentrierte Denkweise zu innovativen Geschäftsmodellen. Dadurch werden neuen Möglichkeiten der Wertschöpfung für den Kunden geschaffen und die Bedeutung von Dienstleistungen unterstrichen (Fielt 2012).

Zur Unterstützung der Entwicklung service-orientierter Geschäftsmodelle stellt die Forschung Gestaltungswissen in Form von Grundlagen und Methoden bereit, welches die Analyse und das Design von Geschäftsmodellen im Servicekontext ermöglichen. Dieses Wissen prägt un-

ser Verständnis von Märkten und Angeboten und beeinflusst dadurch Entscheidungen die in Unternehmen getroffen werden (Nenonen & Storbacka 2010; Zott & Amit 2010). Gerade bei Dienstleistungen sollte jedoch beachtet werden, dass einseitige Ansätze theoretisch unvollständig sind und nicht als Managementmodel oder -richtlinie eingesetzt werden sollten (Grönroos & Helle 2010).

Im Rahmen dieser Entwicklung hat dieses Promotionsvorhaben zum Ziel, die Dienstleistungs- und Geschäftsmodellforschung in einen Dialog zu setzen und eine Geschäftsmodellrepräsentation für service-orientierte Geschäftsmodelle zu entwickeln. Dadurch soll ein mehrseitiges Werkzeug geschaffen werden, das sowohl Wissenschaft als auch Praxis ermöglicht, service-orientierte Geschäftsmodelle zu analysieren, zu verstehen und zu entwickeln.

Forschungsdesign und Methodik

Die vorliegende Dissertation verfolgt einen gestaltungsorientierten Ansatz und wurde auf Grundlage des Design Science Research Paradigmas konzipiert und durchgeführt. Design Science ist ein technologie- und problemlösungsorientierter Ansatz, der die Entwicklung innovativer und anhand ihres Nutzens bewerteter Artefakte vorsieht (March & Smith 1995; Hevner et al. 2004). Mögliche Artefakte sind Konstrukte, Modelle, Methoden und Implementierungen, die Lösungen für Probleme aus Forschung und Praxis liefern (März & Smith 1995). In dieser Arbeit werden bestehendes Wissen und Lösungsansätze auf ein neues bzw. anderes Problem angewendet und angepasst. In diesem Zusammenhang wird von „Exaptation Research“ gesprochen (Gregor & Hevner 2013). Zur Strukturierung dieser Forschung wurde der Design Science Research Process (DSRP) verwendet, der den Forschungsprozess in sechs Prozessschritte unterteilt. Diese sind (1) „*Problemidentifikation und Motivation*“, (2) „*Definition der Zielsetzung der Lösung*“, (3) „*Design und Entwicklung*“, (4) „*Demonstration*“, (5) „*Evaluation*“, (6) „*Kommunikation*“ (Peffers et al. 2006).

Die vorliegende Arbeit beginnt im Prozessschritt *Problemidentifikation und Motivation* und verfolgt einen problemorientierten Ansatz. In diesem Zusammenhang wird zunächst ein Literaturreview durchgeführt, das die Notwendigkeit einer Anpassung bestehender Geschäftsmodellrepräsentationen verdeutlicht. Im Schritt *Definition der Zielsetzung der Lösung* wird die Zielsetzung der Lösung definiert. Dazu wird eine Case Study durchgeführt, die die Integration des Kunden in einem Dienstleistungserbringungsprozess analysiert und Anforderungen an eine Geschäftsmodellrepräsentation ableitet. Der Schritt *Design und Entwicklung* umfasst die

Entwicklung der Service Business Model Canvas. Dazu werden die bereits abgeleiteten Anforderungen angewendet, um eine Adaption der Business Model Canvas von Osterwalder und Pigneur (2010) zu entwickeln. Zur Unterstützung der Entwicklung wird eine formative Evaluation durchgeführt, in der Probanden ein Thinking Aloud Test bewältigen müssen. In der *Demonstration*-Phase wird der Service Business Model Canvas in einer Case Study von EDEKA im Feld angewendet. Dadurch ist es möglich, die Anwendbarkeit der Service Business Model Canvas und ihre Vorteile im Vergleich zur Business Model Canvas aufzuzeigen. Im *Evaluation*sschritt wird die Service Business Model Canvas im Rahmen einer naturalistischen Evaluation überprüft. Um eine möglichst realitätsnahe Evaluation durchzuführen, wird die Fokusgruppenmethode eingesetzt. Hierbei wird im Rahmen von Workshops der Einsatz der Service Business Model Canvas zur Analyse, zum Verständnis und zur Entwicklung von service-orientierten Geschäftsmodellen getestet. Zuletzt umfasst die *Kommunikation* die Präsentation der Ergebnisse im Rahmen dieser Thesis.

In Rahmen des DSRP werden vier Forschungsfragen bearbeitet. Das übergeordnete Ziel ist dabei „*die Analyse und das Design von service-orientierten Geschäftsmodellen mit Hilfe einer weiterentwickelten Geschäftsmodellrepräsentation zu verbessern*“. Da in dieser Dissertation bestehende Lösungen weiterentwickelt werden, wird ein kumulativer Forschungsansatz gewählt. Damit wird der Forderung nach mehr kumulativer Forschung in der Geschäftsmodellforschung nachgegangen (Zott et al. 2011; Veit et al. 2014).

Die erste Forschungsfrage adressiert die Motivation und Problemanalyse des Forschungsvorhabens. Hier wird der State of the Art analysiert und potenzielle Probleme identifiziert. Die Frage lautet: „*Welche Fähigkeiten haben gegenwärtige Geschäftsmodellansätze, um service-orientierte Geschäftsmodelle darzustellen?*“.

Die zweite Forschungsfrage untersucht Anforderungen für das Design einer Geschäftsmodellrepräsentation für Dienstleistungen. Diese werden auf Grundlage eines Dialogs zwischen der Dienstleistungs- und Geschäftsmodellforschung abgeleitet und bieten die Grundlage für die Entwicklung der Service Business Model Canvas. Die zweite Forschungsfrage lautet: *„Was sind Anforderungen für die Repräsentation von service-orientierten Geschäftsmodellen?*“.

Die dritte Forschungsfrage widmet sich dem tatsächlichen Design der Geschäftsmodellrepräsentation. Das Ergebnis eines iterativen Gestaltungsprozesses ist die Service Business Model Canvas. Die Forschungsfrage zur Entwicklung lautet: „*Wie kann die existierende Business*

Model Canvas adaptiert werden, damit sie service-orientierte Geschäftsmodelle repräsentieren kann?“.

Die vierte Forschungsfrage adressiert die Evaluation der Service Business Model Canvas. Während der Evaluation wird das Resultat des Forschungsprozesses und dessen Wirkung näher analysiert. Die Frage lautet somit: „*Verbessert die Service Business Model Canvas die Entwicklung von service-orientierten Geschäftsmodellen?*“.

Ergebnisse

Die Dissertation basiert auf sechs zentralen Publikationen, die jeweils spezifische Beiträge zur Bearbeitung der Forschungsfragen leisten.

Die erste Publikation (**Kapitel 8**) gibt einen Einblick, welchen Einfluss Informationstechnologien auf service-orientierte Geschäftsmodelle im deutschen Maschinenbau haben. Wie die Untersuchung zeigt, entwickeln sich Dienstleistungen zu einem zentralen Element im globalen Wettbewerb. Konkret wird in dieser Arbeit der Einfluss von Informationstechnologien als Treiber dieser Entwicklung untersucht und dadurch der direkte Link zu innovativen Geschäftsmodellen beschrieben. Dadurch werden erste Ergebnisse für die „Problemidentifikation und Motivation“-Phase des DSRP erarbeitet und eine Verknüpfung zwischen Geschäftsmodellen und Informationstechnologie geschaffen. Gleichzeitig wird die erste Forschungsfrage adressiert und werden Möglichkeiten aufgezeigt, wie aktuelle Geschäftsmodellansätze genutzt werden können um service-orientierte Geschäftsmodelle zu repräsentieren.

Die zweite Publikation (**Kapitel 9**) identifiziert Forschungslücken und stellt mögliche Perspektiven für eine Weiterentwicklung von bestehenden Geschäftsmodellansätzen vor. Dabei wird insbesondere auf den Wandel von produkt- zu service-orientierten Geschäftsmodellen eingegangen, der wegen der steigenden Bedeutung von Dienstleistungen für eine Vielzahl von Unternehmen einen hohen Stellenwert hat. Anhand der Untersuchung werden Möglichkeiten identifiziert, wie Geschäftsmodellansätze die Analyse und Entwicklung von service-orientierten Geschäftsmodellen unterstützen können. Mögliche Entwicklungsstränge der Geschäftsmodellforschung können die folgenden Aspekte adressieren: (1) Spezifische Trends und Ziele der Dienstleistungsforschung (wie z.B. die Servitization), (2) die Auswirkungen der Co-Creation auf die Struktur von Geschäftsmodellen, (3) andere Perspektiven auf Geschäftsmodelle (z.B. durch den Einsatz einer Front-Back Logic), (4) die Modellierung von service-

orientierten Geschäftsmodellen im Service Engineering oder New Service Development und (5) die Darstellung der Interaktionen von unterschiedlichen Akteuren. Auch bei dieser Publikation wird die erste Forschungsfrage adressiert. Dieses Mal werden jedoch Forschungslücken aufgezeigt, die in bestehenden Geschäftsmodellansätzen existieren. Im DSRP wird hier die „Problemidentifikation“ adressiert.

Im Rahmen der dritten Publikation (**Kapitel 10**) werden verstärkt die Auswirkungen der Veränderung von produkt-orientierten zu service-orientierten Geschäftsmodellen analysiert. In diesem Zusammenhang wird auf Grundlage einer ersten Untersuchung der Einfluss der Co-Creation auf das Geschäftsmodell eines Unternehmens untersucht. Auf Grundlage dieser Untersuchung wird eine erste Idee entwickelt, wie die Business Model Canvas von Osterwalder und Pigneur (2010) adaptiert werden könnte. Ziel ist es, die bestehenden Nachteile einer einseitigen Perspektive auf ein Geschäftsmodell zu umgehen.

Die vierte Publikation (**Kapitel 11**) erweitert diese Analyse und untersucht den Einfluss von Co-Creation auf bestehende Geschäftsmodellrepräsentationen. Basierend auf der Business Model Ontology von Osterwalder (2004) wird der Einfluss der Co-Creation untersucht und Anforderungen an eine Geschäftsmodellrepräsentation für Dienstleistungen abgeleitet. Als theoretisches Grundgerüst für diese Analyse dient die Service-dominant Logic und weitere Untersuchungen zum Einfluss des Kunden auf die Wertschöpfung und Geschäftslogik von Unternehmen. Die Analyse resultiert in Anforderungen, die von Geschäftsmodellrepräsentationen für die Darstellung von Dienstleistungen eingehalten werden müssen. Es muss (1) eine umfassende Repräsentation von Beziehungen zwischen dem Kunden und dem gesamten Geschäftsmodell ermöglicht, (2) der Anteil des Kunden an den Kosten und Einnahmen dargestellt, (3) der Beitrag des Kunden zu den Aktivitäten und Ressourcen repräsentiert, (4) auf den spezifischen Kontext und damit die Wertschöpfung des Kunden eingegangen und (5) der Einfluss des Kunden auf die Beziehung und den Distributionskanal repräsentiert werden. Dieses Kapitel befasst sich mit der „Definition der Zielsetzung der Lösung“ im DSRP. Dabei werden Anforderungen entwickelt, welche die zweite Forschungsfrage adressieren.

Bezugnehmend auf die identifizierten Forschungslücken und Anforderungen wird die Service Business Model Canvas entwickelt. Die fünfte Publikation (**Kapitel 12**) soll die Anwendbarkeit der Service Business Model Canvas demonstrieren und damit eine erste Evaluation des Artefakts liefern. Dafür wird im Rahmen eines Service Engineering Prozesses bei EDEKA

Lunar eine Case Study durchgeführt, in der ein Mobile Payment System für die Kaufabwicklung bei EDEKA entwickelt wird. Im Zuge der Case Study wird jeweils eine Business Model Canvas und eine Service Business Model Canvas erstellt und anhand der bereits abgeleiteten Anforderungen untersucht. Dadurch wird der Nutzen und die Wirksamkeit der Service Business Model Canvas demonstriert. Im Rahmen dieser Publikation wird die dritte Forschungsfrage adressiert und eine Geschäftsmodellrepräsentation für service-orientierte Geschäftsmodelle präsentiert. Durch den Einsatz in der EDEKA Case Study kann gleichzeitig eine erste Evaluation durchgeführt und damit die vierte Forschungsfrage adressiert werden. Es wird somit die „Demonstration"-Phase des DSRP ausgeführt.

Um die Entwicklung der neuen Geschäftsmodellrepräsentation zu unterstützen, wird in der sechsten Publikation (**Kapitel 13**) eine formative Evaluation der Service Business Model Canvas durchgeführt. Für die formative Evaluation wird die Thinking-Aloud Methode eingesetzt, die es ermöglicht, die tatsächliche Anwendung der Service Business Model Canvas empirisch zu überprüfen und dadurch Implikationen für die weitere Entwicklung abzuleiten. Für die Durchführung der Evaluation wurden Serviceexperten aus Praxis und Wissenschaft eingeladen, die eine Reihe von definierten Aufgaben absolvieren mussten. Neben der formativen Evaluation der Service Business Model Canvas liefert diese Publikation auch einen Ansatz, wie eine empirisch gestützte Entwicklung von Geschäftsmodellrepräsentationen durchgeführt werden kann. Auch der Beitrag dieser Publikation zielt auf die dritte und vierte Forschungsfrage ab. Die formative Evaluation adressiert die vierte Forschungsfrage und liefert zusätzlichen Input für die dritte Forschungsfrage. Der Input umfasst Implikationen für die Gestaltung der Service Business Model Canvas. Im DSRP wird die Phase „Design und Entwicklung" adressiert.

Zuletzt führt die siebte Publikation (**Kapitel 14**) einen Prozess zum Einsatz der Service Business Model Canvas ein und präsentiert die Resultate einer naturalistischen Evaluation. Zur Evaluation wird die Fokusgruppen-Methode eingesetzt, die auf die Entwicklung, das Verständnis und die Analyse von service-orientierten Geschäftsmodellen abzielt. Da die Evaluation bei einem deutschen IT-Infrastructure und -Consulting Unternehmen durchgeführt wurde, konnte die Service Business Model Canvas mit echten Menschen, in einem echten System und unter echten Rahmenbedingungen eingesetzt werden (Sun & Kantor 2006). Diese Publikation widmet sich explizit der „Evaluation" im DSRP und somit auch der vierten Forschungsfrage.

Theoretischer Beitrag

Diese Dissertation leistet theoretische Beiträge zur Geschäftsmodellforschung, Dienstleistungsforschung und zum Design Science Research. Im Zuge des Beitrags zur Geschäftsmodellforschung stellt diese Dissertation eine erweiterte Geschäftsmodellrepräsentation für serviceorientierte Geschäftsmodelle bereit. Dazu wird Wissen aus der Dienstleistungsforschung zur Servicelogik auf die Kernelemente der Geschäftsmodelle angewendet. So wird die Darstellung einer service-orientierten Geschäftslogik ermöglicht. Weiterhin wird eine Evaluationsmethode für die Entwicklung neuer Geschäftsmodellrepräsentation vorgestellt. Für die Dienstleistungsforschung schlägt diese Dissertation eine Möglichkeit zur konkreten Operationalisierung der Co-Creation vor. Dazu wird die Geschäftsmodellperspektive genutzt, die Co-Creation als integralen Bestandteil der Wertschöpfungslogik versteht und konkretisiert. An dieser Stelle unterstützt sie die Dienstleistungsforschung mit einer Vielzahl unterschiedlicher Beispiele, die den service-orientierten Wandel in der Geschäftslogik zahlreicher Branchen illustriert. Zusätzlich liefert diese Dissertation ein Beispiel für einen kumulativen Forschungsprozess im Design Science Research. In diesem Zuge wird eine Erweiterung des Design Science Research Process entwickelt, welche die Durchführung eines kumulativen Forschungsprozesses beschreibt.

Der zentrale Beitrag dieser Dissertation liegt in der Auseinandersetzung zwischen der Dienstleistungs- und Geschäftsmodellforschung, die in der Entwicklung der Service Business Model Canvas mündet. Die Service Business Model Canvas zielt auf eine umfassende Erweiterung der Business Model Canvas von Osterwalder und Pigneur (2010) durch die explizite Erweiterung einer dienstleistungsorientierten Perspektive. Diese Perspektive ist durch die Betonung dienstleistungsspezifischer Eigenschaften, wie Co-Creation, Interaktionen und Beziehungen bestimmt. Diese Erweiterung ist für die Analyse, Darstellung und Entwicklung von Servicegeschäftsmodellen notwendig.

Praktischer Beitrag

Die zentralen Beiträge dieser Dissertation ergeben sich aus der Entwicklung der Service Business Model Canvas für den Einsatz im Unternehmenskontext. Dies ist insbesondere von Bedeutung, da Geschäftsmodellansätze als wichtige Elemente des Werkzeugkastens von Praktikern angesehen werden (Hacklin & Wallnöfer 2012). Geschäftsmodellrepräsentationen, als ein spezifisches Werkzeug der Geschäftsmodellansätze, unterstützen Praktiker bei der Er-

stellung konsistenter Konzeptualisierungen von Geschäftsmodellen (Veit et al. 2014). Da die Konzeptualisierung unterschiedliche Ziele verfolgen kann, existieren unterschiedliche Repräsentationen, die sich in ihren Zielen und Strukturen unterscheiden (Kundisch et al. 2012; Veit et al. 2014).

Ausgehend von der Business Model Canvas, als einer der am weitesten verbreiteten Ansätze in Theorie und Praxis, ermöglicht die Service Business Model Canvas eine umfassende Darstellung der Geschäftslogik von Dienstleistungen. Damit erhalten Praktiker ein Werkzeug, das sie für die Analyse, das Design und das Verstehen von service-orientierten Geschäftsmodellen einsetzen können. Durch die Anwendung dieses Werkzeugs können Praktiker die Integration von Kunden und Partnern im eigenen Geschäftsmodell verstehen. Die Integration dieser Akteure hat einen umfassenden Einfluss auf service-orientierte Geschäftsmodelle. Dieser Einfluss basiert auf der Integration von Ressourcen, Übernahme von Aktivitäten oder Entscheidungen in Bezug auf das Wertversprechen (Moeller 2008; Grönroos & Ravald 2011; Zolnowski & Böhmann 2013a). Weiterhin ermöglicht die Service Business Model Canvas eine strategische Planung von service-orientierten Geschäftsmodellen, da Praktiker die Wechselwirkungen und Stellhebel in der eigenen Geschäftslogik besser verstehen und dadurch beeinflussen können.

Ausblick

Aufbauend auf den vorliegenden Forschungsergebnissen kann die zukünftige Forschung unterschiedliche Entwicklungspfade beschreiten. Die Service Business Model Canvas bietet die Möglichkeit, das Zusammenspiel unterschiedlicher Akteure innerhalb eines service-orientierten Geschäftsmodells zu repräsentieren. Aufgrund der Beschaffenheit von Canvas-Geschäftsmodellrepräsentationen steigt die Komplexität der Darstellung bei wachsender Anzahl von Akteuren außerordentlich. Deshalb sollte im nächsten Schritt ein expliziter Repräsentationsansatz für netzwerkartige Geschäftsmodelle entwickelt werden, der die Besonderheiten von service-orientierten Geschäftsmodellen berücksichtigt und größere Netzwerke von Akteuren in einer einfachen Art und Weise darstellen kann.

Ein weiterer Pfad könnte die Transformation und Evolution von Geschäftsmodellen berücksichtigen. Gerade durch die Zusammenarbeit mit dem Kunden unterliegen Geschäftsmodelle häufig einer dauerhaften Transformation oder Evolution. Dies bedeutet, dass sich das Geschäftsmodell im Laufe der Zeit anhand sich verändernder Anforderungen des Kunden wei-

terentwickelt und verändert. Die Planung und Steuerung dieser Veränderungsprozesse stellt eine große Herausforderung dar, die von Unternehmen bewältigt und von Geschäftsmodellrepräsentationen unterstützt werden kann.

Für die Entwicklung von tragfähigen Geschäftsmodellen müssen unterschiedliche Wissensgebiete kooperieren. Dies führt dazu, dass die Geschäftsmodellentwicklung häufig in einem kollaborativen Prozess durchgeführt wird. Zur Unterstützung der Kollaboration können innovative Technologien genutzt werden, welche die Kommunikation, Kooperation und Koordination zwischen Teilnehmern eines Designworkshops unterstützen (Leimeister 2014). Ein weiterer Entwicklungspfad könnte diese Herausforderung annehmen und auf Grundlage der Service Business Model Canvas ein Tool zur kollaborativen Entwicklung von serviceorientierten Geschäftsmodellen entwickeln. In diesem Zusammenhang könnten Innovationsprozesse stärker fokussiert und die Service Business Model Canvas darin positioniert werden.

Stichworte: Service, Dienstleistungen, Geschäftsmodelle, Geschäftsmodellrepräsentationen, Service Engineering, Innovation, Service Business Model Canvas

Abstract

Service has an enormous importance for many economies. In Germany in 2012, more than 73% of the population was employed in the service sector (The Federal Statistical Office 2014). Services are omnipresent and can have a variety of instantiations, from a more traditional and ordinary service, such as a haircut, to innovative and highly complex information technology services. From a corporate perspective, developing business with service is a key goal and a substantial challenge for many companies in today's markets (Eggert et al. 2014). Drivers such as global competition, advances in technology, and attractive new market opportunities foster a process of servitization and thus motivate the search for innovative service business models (Buhl et al. 2008; Neu & Brown 2008).

This change has also spawned interest in business model research in a service context (Chesbrough & Spohrer 2006; Zott et al. 2011; Fielt 2012). In contrast with traditional innovations that comprise mostly product development or traditional research and development (Sawhney et al. 2006), the transformation to a customer-centric mindset leads to innovative business models. These innovations focus on new possibilities for value creation for the customer and thus often emphasize service (Fielt 2012).

Ideally, robust research should underpin conceptual foundations and the design of methods for the analysis and design of business models in the service context. Such methods shape our understanding of markets and offerings and thus influence decisions made in enterprises (Nenonen & Storbacka 2010; Zott & Amit 2010). This thesis focuses on business models and co-creation in service environments. Because of the substantial shift that emphasizes value creation as service logic, this thesis centers on the development of a service-specific business model representation that enables academics and professionals to understand, analyze, and design the business logic of a service in a comprehensive way. Rooted in a cumulative research design this thesis contributes to the fields of business model research, service research, and design science research.

First, this thesis contributes to business model research by proposing a business model representation for service. Within this contribution, knowledge from service logic is connected to the core elements of the business logic that is represented with business models. Moreover, an evaluation method is designed to help successfully develop new business model representations. Second, this thesis proposes a way to translate and operationalize co-creation. To do so,

business model thinking helps delineate co-creation of value as part of a general business logic. In addition, service research supplements several examples for an ongoing fundamental, service-driven shift in the business logic of many industries. Third, a cumulative research was conducted. In doing so, an example of cumulative research in and a slight extension of the DSRP tool set is given.

The central contribution of the dialogue between business model research and service science—two previously unconnected research streams—is the SBMC. The SBMC aims for an extensive expansion of the BMC (Osterwalder & Pigneur 2010) to a service-specific perspective. Identified service-specific characteristics, such as co-creation, interaction, and relationship, determine important attributes of a service logic. These attributes must be considered during the analysis, representation, and development of service business models.

Key words: service, business model, business model representation, service engineering, innovation, service business model canvas.

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List of Abbreviations

AAL	Ambient Assisted Living
AMCIS	Americas Conference on Information Systems
BMC	Business Model Canvas
BMO	Business Model Ontology
DLM	Dienstleistungsmodellierung
DSRP	Design science research process
ECIS	European Conference on Information Systems
ERP	Enterprise Resource Planning
GDP	Gross domestic product
GDL	Goods-dominant logic
HICSS	Hawaii International Conference on System Sciences
IS	Information systems
IT	Information technology
MST	Micro Systems Technologies
REQ	Resource-Event-Agent
RQ	Research question
SBMC	Service Business Model Canvas
SDL	Service-dominant logic

1 Introduction

1.1 Motivation

Service has gained increasing importance in information systems (IS) research (Satzger et al. 2010; Leimeister 2012; Böhmann et al. 2014). Within IS, the term "service" is used in two ways. In one usage, in line with service definitions from computer science, a technical point of view is emphasized; in the other usage, the word takes on a more economic character (Buhl et al. 2008; Spohrer & Maglio 2010). In the context of this thesis, *service* is applied in an economic way. Thus, service is a distinct type of exchange that is delivered by a type of process. Within this process, competencies are applied in human interactions for the benefit of another party (Spohrer & Maglio 2010).

From an economic perspective, service has an enormous importance for many economies. In Germany in 2012, more than 73% of the population was employed in the service sector (The Federal Statistical Office 2014). Services are omnipresent and can have a variety of instantiations, from a more traditional and ordinary service, such as a haircut, to innovative and highly complex information technology (IT) services. Information technology services in particular are gaining growing economic importance. Drivers for this development are new concepts such as cloud computing and the increasing integration of IT into physical products (Leimeister 2012), which results in so-called cyber-physical systems and product-service systems.

From a corporate perspective, developing business with service is a key goal and a substantial challenge for many companies in today's markets (Eggert et al. 2014). Drivers such as global competition, advances in technology, and attractive new market opportunities foster a process of servitization and thus motivate the search for innovative service business models (Buhl et al. 2008; Neu & Brown 2008). This development is accompanied by a substantial shift in research that emphasizes interdisciplinary approaches (Buhl et al. 2008) and conceptualizes value creation as service logic (Grönroos 2006; Vargo & Lusch 2008; Grönroos & Ravald 2011). Within service logic, the customer's role is emphasized. The customer's integration into the value-creation process leads to a transformation from a product-centric to a customer-centric mindset (Prahalad & Ramaswamy 2000; Gouthier & Schmid 2003).

This change has also spawned interest in business model research in a service context (Chesbrough & Spohrer 2006; Zott et al. 2011; Fielt 2012). In contrast with traditional inno-

vations that comprise mostly product development or traditional research and development (Sawhney et al. 2006), the transformation to a customer-centric mindset leads to innovative business models. These innovations focus on new possibilities for value creation for the customer and thus often emphasize service (Fielt 2012). A precursory study on the impact of innovative technology on business models in service industries has shown the manifold opportunities of innovative service concepts (Zolnowski et al. 2011a). In this context, researchers and practitioners have begun developing methods and tools that support transformation toward innovative service-oriented business models.

Ideally, robust research should underpin conceptual foundations and the design of methods for the analysis and design of business models in the service context. Such methods shape our understanding of markets and offerings and thus influence decisions made in enterprises (Nenonen & Storbacka 2010; Zott & Amit 2010).

One way to contribute to the knowledge base of design research is to extend existing solutions from the literature (Gregor & Hevner 2013). Existing solutions suffer from limitations pertaining to robustness and cumulation of knowledge for several reasons. First, the business model concept is not well adapted to service-related transformations (Zolnowski & Böhmann 2011; Fielt 2012). Moreover, there are ample models, methods, and tools for analyzing and designing business models but relatively few examples of cumulative design research (Zott et al. 2011). Most authors propose different, but independent, artifacts for the representation and analysis of business models, which help in addressing specific issues but also exhibit incommensurable concepts and design knowledge (e.g., (McCarthy 1982; Slywotzky & Morrison 1998; Timmers 1998; Weill & Vitale 2001; Wirtz 2001; Gordijn 2002; Osterwalder 2004; Bouwman et al. 2005; El Sawy et al. 2008; Al-Debei 2010).

In line with existing discussions in design science (Niederman & March 2012) and business model research (Zott et al. 2011; Veit et al. 2014) that call for more cumulative research, this thesis aims to explore a different route for advancing knowledge about business models. This route emphasizes cumulative design research and works toward evidence-based design of a method for representing service business models.

1.2 Business Model Representations

Business model representations can be used to analyze, design, and compare different value-creation and value-capturing approaches. To achieve this aim, business model research has

received a lot of attention and manifold contributions since the emergence of the Internet in the mid-1990s (Osterwalder & Pigneur 2004; Zott et al. 2011). From a practical point of view, the Internet had an enormous impact on existing business models and led to a change of structures and rules (Sahlman et al. 1999; Porter 2001). Taking an academic perspective, this attention is reflected by the sharp increase in publications considering business models in 1995 (Ghaziani & Ventresca 2005; Zott et al. 2011). Nevertheless, a variety of literature reviews show that there is still no unanimity about the definition in the business model research community (Scheer et al. 2003; Osterwalder 2004; Fielt 2011; Zolnowski & Böhmann 2011).

In addition to all the different definitions, multiple ontologies exist for representing business models. The most common ones are the e3-value ontology (e3-value) (Gordijn 2002) and the business model ontology (BMO) (Osterwalder 2004) [1].

In general, research on business model representations can be divided into two main research streams (Burkhart et al. 2011). The first research stream comprises a graphical flow perspective of the business model and, thus, the process of value exchange in a business. This stream is represented by, for example, the work of McCarthy (1982), Slywotzky and Morrison (1998), and Gordijn (2002). The second stream focuses on a textual representation of constitutive characteristics of business models. The authors emphasize the definitions of essential components of business models, such as in Timmers (1998), Osterwalder (2004), Al-Debei (2010), and Zott et al. (2011). With this focus, business models render a system-level holistic overview and emphasize the business logic of a firm (Zott et al. 2011).

For the purpose of this thesis, and with a focus on the design of a specific business model representation, the author follows a holistic view of the business model. According to this perspective, a business model is an abstract representation that depicts a set of elements and their relationships to explain how a company creates and captures value (Chesbrough & Rosenbloom 2002; Osterwalder 2004; Al-Debei 2010; Zolnowski & Böhmann 2013b). A popular representative of the holistic perspective is the BMO (Osterwalder 2004), which is derived from a literature overview and represents a formalization of the elements, relationships, vocabulary and semantics of a business model. The business model canvas (BMC) was

[1] Academic reception: 1,235 citations on Google Scholar as of 2015-03-13, compared with 719 citations for e3-value. Proxy for adoption in practice: more than 4 million Google hits for “business model canvas” compared with fewer than 32,000 hits for “e3-value.”

developed on the basis of the BMO. The BMC (Osterwalder & Pigneur 2010) is a visualization of the key elements of a business model and their relations. The BMC was evolved particularly for use in practice.

Business models are an important part of the tool set for the management of innovation (Hacklin & Wallnöfer 2012). Especially in rapidly growing areas, the emergence of new business models is an important topic. In this context, the business model construct helps in understanding, analyzing and communicating the business logic between the stakeholders (Gordijn & Akkermans 2001).

The area of service has received increasing attention, garnering greater focus in academic research in the last few years (Grönroos & Ravald 2009). Analogously, service-oriented business models have become increasingly important in practice because service has become one of the key drivers of growth in many economies around the world (Chesbrough & Spohrer 2006). By offering service, companies can secure their revenue generation and turnover in highly competitive markets (Stolz 2006). In particular, firms in technology industries, such as IT, aerospace, medical technology, and automotive, capture an increasing share of their income and profits with services (Neely 2009). For these enterprises, services thus have become an essential part of their business models. This leads companies to transform their product-based business models to service-based business models.

Another example is the servitization in manufacturing industries (Neely 2007, 2014). This transformation results in a large variety of service offerings. In Neely's (2007) empirical analysis, 12 service offerings are identified, including Consulting Services, Design and Development Services, Financial Services, and more.

As extant literature has shown, business models, as a system-level holistic perspective on business (Zott et al. 2011), do not consider all necessary service-specific characteristics (Zolnowski & Böhmann 2011). Considering present approaches, in particular, mostly one-sided approaches exist, with limitations regarding co-creation (Zolnowski et al. 2012). However, according to the service management literature, "one-sided approaches are theoretically incomplete and misleading as management models and guidelines" (Grönroos & Helle 2010, p. 567).

Given the widespread use of holistic approaches, particularly the BMO, in research and practice, such a critical review and extension is still an open research issue (Fielt 2012). Nevertheless, first conceptual modeling approaches have been proposed that consider service-specific aspects, such as using e3-value, and suggest service-specific extensions (de Kinderen & Gordijn 2008; Razo-Zapata et al. 2011). Yet these approaches do not consider business models in a system-level, holistic way. Rather, they enable users to represent value configurations in business (Gordijn et al. 2005). Moreover, the use of these approaches has not yet been evaluated in any way.

In summary, the business model concept offers a system-level holistic view on the business logic. This view focuses on activities that are necessary to successfully execute the business and the value that is offered to the customer by explaining value creation and value capturing (Zott et al. 2011). Thus, the value—and, in a narrow view, the value proposition—is the central element of a business model (Osterwalder 2004; Al-Debei 2010; Zolnowski & Böhmann 2011). In the context of the transformation from a product-centric to a customer-centric mindset, value creation and service as business logic have become important factors in the business models of many industries.

1.3 Service and Service Logic

As noted previously, the term "service" can be understood in a technical and economic way. The technical understanding is based in computer science (Buhl et al. 2008). In this perspective, more recent definitions understand service as a software artifact that offers a function (Buhl et al. 2008). In this thesis, however, service is understood in an economic way that is based on established research streams in IS literature. In this perspective, a multitude of service definitions can be identified. Traditional definitions define service with negative, enumerative, and constitutive definitions. Negative definitions delimit services from products; enumerative definitions aim to define service with detailed examples; and constitutive definitions can be divided into potential-oriented, process-oriented, and results-oriented approaches (Corsten 1997; Buhl et al. 2008). Drawing from existing constitutive definitions, the "IHIP" criteria arose. These criteria are (I) intangibility, (H) heterogeneity, (I) inseparability, and (P) perishability and aim to characterize service (Lovelock & Gummesson 2004). However, because they are rooted in a goods-dominated mindset, these definitions are criticized for being too narrow, with outdated characteristics (Edvardsson et al. 2005).

In contrast with the old service definitions, Vargo and Lusch (Vargo & Lusch 2004) present a new perspective on the exchange in economics, called the service-dominant logic (SDL). The focus on service was necessary because of the growing importance of the exchange of intangibles, skills, and knowledge as well as processes instead of tangible goods (Vargo & Lusch 2004). With SDL, Vargo and his colleagues created an unifying framework for a more comprehensive view of marketing (Vargo & Morgan 2005; Vargo & Lusch 2006).

The main focus of SDL is value and value creation, particularly value for the stakeholder as well as the way the value is created. Service is the main basis for value exchange and is created with the cooperation of different actors (Vargo & Lusch 2004; Vargo & Lusch 2011).

In contrast with the classic goods-dominant logic, service is not defined by the IHIP criteria. Moreover, Vargo and Morgan (2005) describe these criteria as four service antitheses (Vargo & Lusch 2004). Rather, service is defined as "the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself" (Vargo & Lusch 2004, p. 2). Other service definitions take a similar direction. For example, Grönroos (2008b) defines service as "a process that consists of a set of activities which take place in interactions between a customer and people, goods and other physical resources, systems and/or infrastructures representing the service provider and possibly involving other customers, which aims at assisting the customer's everyday practices." (Grönroos 2008b, p. 300).

To characterize this new dominant logic, Vargo and Lusch (2004) propose foundational premises. The most recent publications of Vargo (Vargo 2012) and Lusch (Lusch 2012) show a hierarchy between these foundational premises and thus emphasize four so-called core premises. These core premises are (Lusch 2012; Vargo 2012; Lusch & Vargo 2014): (1) service is the basis of any exchange, (2) value is always co-created with the customer, (3) all actors are resource integrators, and (4) value is uniquely and phenomenologically determined by the beneficiary.

The first core premise underscores the importance of service in economics and claims that service is exchanged for service. Furthermore, service is treated as a singular term. The change from the term "services" to "service" underscores the process-oriented characteristic as well as the definition of service, which emphasizes the use of one's resources for the benefit of another actor. The next core premise highlights a broad involvement of the customer in

the value-creation process (Prahalad & Ramaswamy 2004; Vargo & Lusch 2004) and, thus, the understanding of the customer as part of the entire service (Spohrer et al. 2008; Edvardsson et al. 2010), which results in enhanced value for all actors (Kristensson et al. 2008). An important message of this premise is that a service's resources and activities do not create value by themselves. Rather, the value is generated by co-creation between the provider and the customer. Simultaneous co-creation illustrates an important change in the logic of value provision. It describes a shift from value in exchange (transactional) to value in use (relational) or value in context (Vargo & Lusch 2004; Edvardsson et al. 2010; Chandler & Vargo 2011). Co-creation can be viewed as strongly related to the third core premise. In this premise, Vargo and Lusch (Vargo & Lusch 2008) argue that all actors (i.e., firms and customers) are resource integrators. Resources, like knowledge and skills, must be integrated into the service process by actors. The integration of these resources facilitates the co-creation of value and helps fulfill the customer's needs and demands. The last core premise defines the nature of value. The description of value as unique and phenomenological means that it is idiosyncratic, experiential, contextual, and meaning laden (Vargo & Lusch 2008). Thus, value is subjective and has a unique character that is shaped by the individual context of every actor.

In summary, SDL highlights the importance of co-creation and customer integration in many ways. This is necessary because the nature of value is uniquely and phenomenologically determined by the beneficiary (Vargo & Lusch 2004, 2008). Furthermore, the integration of resources as well as operation on available resources is necessary to receive the desired value from a service (Vargo & Lusch 2006; Vargo & Lusch 2008).

Both premises highlight the importance of the customer in the service provision process. This is reflected by the customer's manifold influences on a service. As Gummesson (Gummesson 1998) states, one could argue with service logic that the customer may need the participation of the provider to create value. A good example is the value-in-use concept of SDL. It describes the importance of the customer in the value-creation process and the need for his or her skills and knowledge (Vargo & Lusch 2004). The integration of the customer's resources can have different goals. A provider integrates resources to serve the customer better or to co-create greater value. Analogously, a customer integrates resources to enable the provider to better serve him or her or to create greater value co-creation (Kohli 2006).

Value in use is only one example of co-creation. Service-dominant logic emphasizes the integration of human resources, such as skills and knowledge (operant resources) (Vargo & Lusch 2004, 2008), and operand resources (e.g., physical resources) in value creation. Furthermore, beyond the provision of these resources, customers have an influence on decision making concerning service provision activities (Moeller 2008; Payne et al. 2008).

However, the all-encompassing definition of co-creation in the SDL is also a point of critique. Thus, Grönroos provides a more differentiated definition of co-creation. He argues that value creation and the interaction between provider and customer can be separated into value facilitation, value co-creation, and sole value creation. In value facilitation, the provider focuses his or her production process and combines skills and knowledge to create an offering. If the customer is needed, he or she acts as a co-producer. During value co-creation, the provider and customer work together and interact in a joint value creation. Finally, in the sole value creation, the customer applies the obtained resources and focuses on his or her own processes for value creation (Grönroos 2008b; Grönroos 2008a; Grönroos & Ravald 2009).

The previously described foundational premises result in eight changes in the mindset of value creation. These changes are illustrated in Table 1.

	Goods-Dominant Logic	Service-Dominant Logic
1	Goods	Service(s)
2	Tangible	Intangible
3	Operand resources	Operant resources
4	Asymmetric information	Symmetric information
5	Propaganda	Conversation
6	Value added	Value proposition
7	Transactional	Relational
8	Profit maximization	Financial feedback

Table 1: Comparison of a goods-dominant logic and service-dominant logic
Source: (Lusch & Vargo 2008; Edvardsson et al. 2011)

Because of the growing importance of service, the SDL and service logic as business logic were created. Both emphasize the importance of the customer in the business logic of service and call for more multi-sided research and management approaches.

1.4 Research Goals and Research Questions

This thesis focuses on business models and co-creation in service environments. Because of the substantial shift that emphasizes value creation as service logic, this thesis centers on the

development of a service-specific business model representation that enables academics and professionals to understand, analyze, and design the business logic of a service in a comprehensive way. Thus, the overall research aim is as follows:

To improve the analysis and design of service business models with a revised business model representation.

As a special challenge, this thesis answers existing calls for more cumulative research in business model research (Zott et al. 2011; Veit et al. 2014).

To achieve this goal, several steps must be taken. In the first step, an analysis of the current situation is conducted. This state-of-the-art analysis shows problems of existing business model approaches as well as potential research directions, and it thus motivates this research. Important parts of this research are already published in Zolnowski and Böhmann (2011), Zolnowski et al. (2011c), and Zolnowski et al. (2012). The research question for the first step is:

RQ1: What capabilities do present business model approaches have to represent service business models?

In line with the research motivation and the identified research gaps, the next step is to derive requirements for a service business model. These requirements are based on service science research and represent objectives that the new business model representation must fulfill. Important parts of this research are published in Zolnowski and Böhmann (2013a). Thus, the following research question is answered:

RQ2: What are the requirements for representing service business models?

Drawing from the derived objectives, a novel business model representation for service must be developed. The development activities are processed iteratively and are based on existing knowledge of research on business models and service science. A first iteration of the approach was published in Zolnowski et al. (2011b); additional work is published in Zolnowski and Böhmann (2013a) and Zolnowski and Böhmann (2014). This research answers the following research question:

RQ3: How can the existing BMC be extended to represent service business models?

Before concluding this research, the developed service business model representation must be assessed. This evaluation helps shed light on the potential outcomes of this approach and offers suggestions for further research. A demonstration of the application of the SBMC is already published in Zolnowski et al. (2014). Furthermore, an evaluation of the SBMC is in review (Zolnowski 2015). The research question for this last step is the following:

RQ4: Does the SBMC improve the design of service business models?

This thesis is conducted on basis of these research questions. Next, the structure of this thesis is described.

1.5 Structure of this Thesis

The overall research presented in this thesis follows a design science research approach (Hevner et al. 2004) and was structured according to the design science research process (DSRP) (Peffers et al. 2008). This thesis is structured as follows (see Figure 1):

Wrapper	**1. Introduction**	**2. Research design**	**3. Publications**	**4. Theoretical contribution**
	5. Practical contribution	**6. Limitations**	**7. Implications for further research**	
Publications	8. Publication	Understanding the impact of remote service technology on service business models in manufacturing: From improving after-sales services to building service ecosystems		RQ1
	9. Publication	Business modeling for services: Current state and research perspectives		RQ1
	10. Publication	Introducing a Co-Creation Perspective to Service Business Models		RQ2
	11. Publication	Customer integration in service business models		RQ2
	12. Publication	Representing Service Business Models with the Service Business Model Canvas - The Case of a Mobile Payment Service in the Retail Industry		RQ3/RQ4
	13. Publication	Formative Evaluation of Business Model Representations - The Service Business Model Canvas		RQ3/RQ4
	14. Publication	Designing Services with Business Model Representations - Evaluation of the Service Business Model Canvas		RQ4

Figure 1: Structure of this thesis
Source: own representation

The first chapter contains an introduction in which this thesis is motivated and the research questions are introduced. In the second chapter, design science research as design of the over-

all research is introduced. The third chapter provides a description of the publications that constitute this cumulative thesis. In the fourth chapter, the theoretical contributions of this research are given. The fifth chapter illustrates the practical contributions, followed by the research's limitations in the sixth chapter. Finally, implications for further research are introduced. The last chapters comprise published papers that constitute the main contribution of this research.

2 Research Design

2.1 Design Science Research

This chapter introduces the research design of this thesis. The research design circumscribes the research strategy that is applied to answer the proposed research question. Details about the research design need to be provided to enhance the intersubjectivity and, thus, the comprehensibility of the research process.

The research in IS can be divided into two complementary research paradigms (March & Smith 1995; Hevner et al. 2004). First, behavioral science explains human or organizational behavior and is rooted in natural science research methods. Second, design science is a problem-solving paradigm and is rooted in engineering and the sciences of the artificial (Hevner et al. 2004). With its roots in the sciences of the artificial, design science research contains a discourse about how to create artifacts with predefined properties (Simon 1996). In particular, design science is a technology-oriented process that creates innovative artifacts that are valued by their utility (March & Smith 1995; Hevner et al. 2004). The two main design processes are *build* and *evaluate*, and they result in *constructs*, *models*, *methods*, and *implementations*. They provide solutions for identified organizational problems and thus have a direct influence on research and practice (March & Smith 1995). Mainly, design science research focuses on wicked problems (Hevner et al. 2004).

To achieve high-quality design science research, Hevner et al. (2004) propose seven guidelines. The *first* guideline defines the result of a design science process as a purposeful IT artifact that addresses an important organizational problem. As mentioned previously, the result is a construct, model, method, or implementation. The *second* guideline emphasizes the problem relevance of the research. Thus, a result must be important and relevant to an identified organizational problem. *Third*, the result of a design science process needs to be evaluated and its utility, quality, and efficacy must be demonstrated. *Fourth*, all results must have a clear contribution. Possible contributions are the artifact itself, foundations, or methodologies. The *fifth* guideline considers the rigor of the research. Rigorous research consists mainly of the application of rigorous methods in any stage of the research process. *Sixth*, the research process is conducted iteratively. An iterative search helps achieve better results for the identified problems. The *seventh* guideline demands adequate communication of the research pro-

cess. Because of its direct influence on both research and practice, possible audiences can be technology and management oriented (Hevner et al. 2004).

In line with these guidelines and other prior literature, Peffers et al. (2006) propose the DSRP. With this conceptual model, they offer an approach for conducting design science research in IS. The nominal process sequence contains six process steps. The sequence is illustrated in Figure 2 and is described next.

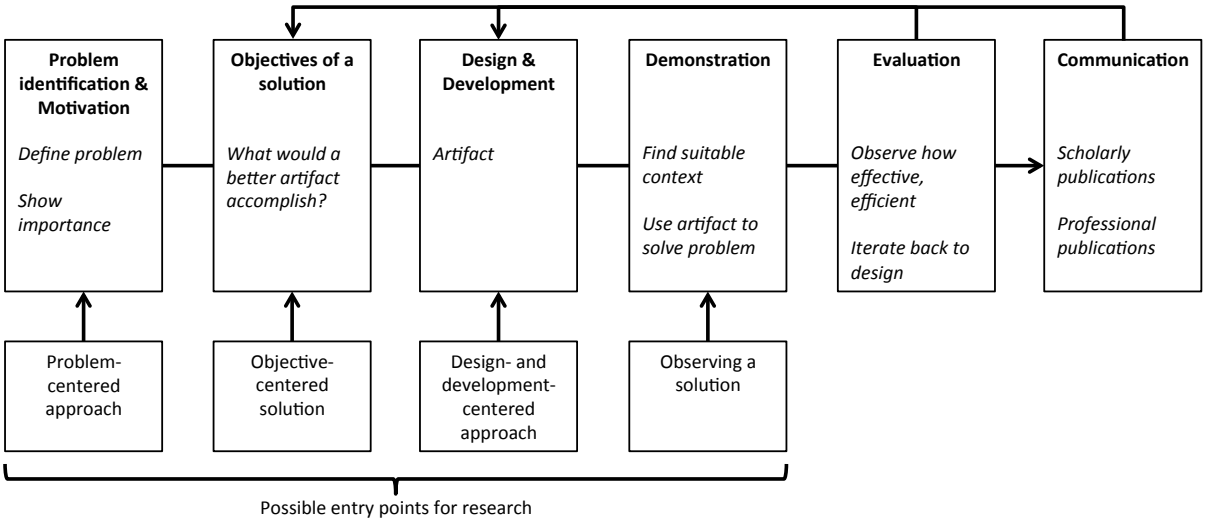

Figure 2: Nominal process sequence of the DSRP model
Source: (Peffers et al. 2006)

The *first step* of the DSRP is problem identification and motivation. In this stage, the research problem and the potential value of the solution are described and defined. This is necessary to clarify the goals of the research process and convince the reader of the research's importance. As the first possible entry point for a research process, it offers a problem-centered approach. The *second stage* considers the problem's definition and infers objectives of a potential solution. Possible objectives can be quantitative and qualitative. In this stage of research, existing knowledge and current solutions must be reflected. As the second entry point of a research process, an objective centered solution is pursued. The *third step* consists of design and development activities. These activities contain the definition of the desired functionality, its architecture, and the design of the artifact itself. In this stage, previously defined objectives and existing knowledge must be considered. If this stage is used as an entry point, a design- and development-centered approach is selected. After the development of the artifact, in the *fourth step* a demonstration of the efficacy is needed. For this step, different approaches can be applied, such as an experiment, a simulation, or a case study. As the last entry point for a research process, this step would provide an observation of a solution. The *fifth step*, the eval-

uation—a crucial step in design science research (March & Smith 1995)—consists of an observation and measurement of the solution's problem-solving capability. This includes a comparison of the previously defined objectives with the observed results. Different possibilities include activities such as quantitative performance measures, client feedback, or simulations. Depending on the capability of the proposed solution, the authors can iterate back to a previous step of the DSRP. Finally, the *sixth step* considers the communication of the whole research process. The structure of the communication should be based on the nominal process sequence of the DSRP (Peffers et al. 2006).

2.2 Research Methodology of this Research

Drawing from the DSRP, this thesis focuses on the analysis and design of service business models. The goal of the contribution is to improve the present business model artifact of Osterwalder (2004)—and, in particular, the BMC (Osterwalder & Pigneur 2010)—by increasing its usability in service environments.

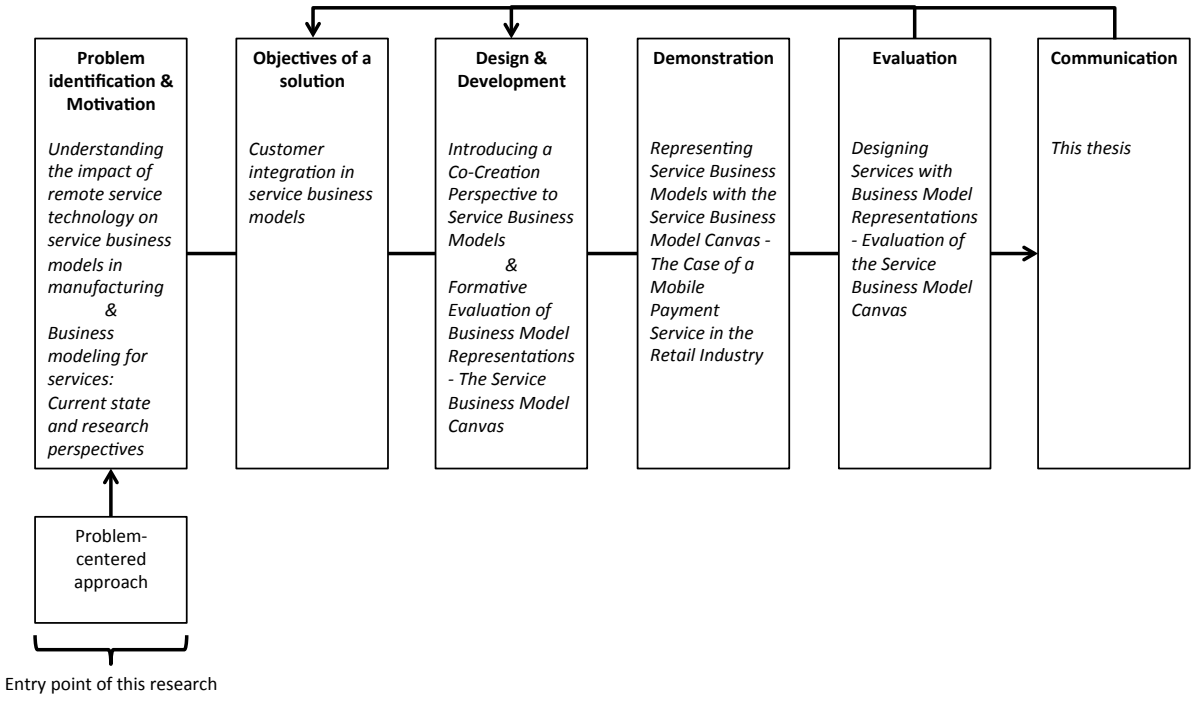

Figure 3: Research design of this thesis
Source: own representation based on (Peffers et al. 2006)

This research enters the nominal process sequence in the *problem identification and motivation* stage and is thus a problem-centered approach. The application of the DSRP model is illustrated in Figure 3.

This thesis is situated in the design science research paradigm in IS research. Design science research is a problem-solving paradigm rooted in engineering and the sciences of the artificial (Hevner et al. 2004).

The research contribution of this thesis is situated in exaptation research (Gregor & Hevner 2013). Thus, this thesis addresses known solutions from business model research that are applied to new, service-related problems.

In context of this thesis, the business model representation is the artifact that must be developed. For this development, the DSRP by Peffers et al. (2006) is applied. With this conceptual model, Peffers et al. (2006) propose an approach for conducting design science research in IS. The nominal process sequence consists of the following six process steps (Peffers et al. 2006; Peffers et al. 2008).

This thesis starts with the problem identification and motivation. As the first possible entry point for a research process, it offers a problem-centered approach. During the problem identification and motivation stage, it is shown that existing business model approaches do not cover all necessary service-specific aspects. This issue can be identified in academic literature as well as in the practical application of existing business model representations.

The second step considers the problem's definition and infers objectives of a potential solution. In this stage, objectives of the desired solution are derived. An important source for these objectives is a literature review on the topic of business models and service science.

The third step consists of design and development activities. These activities are the definition of the desired functionality, its architecture, and the design of the artifact itself. In this stage, previously defined objectives and existing knowledge must be considered. In this stage, a comprehensive analysis of the literature is conducted to consider existing knowledge in academic literature. Then, the new artifact is designed.

After the development of the artifact, the fourth step is to demonstrate its efficacy. Thus, different approaches can be applied, such as an experiment, a simulation, or a case study. As the last entry point for a research process, this step provides an observation of a solution. In this stage, the solution is applied in a real-world situation. In the case of EDEKA, a service business model for a near field payment service was developed and implemented.

A crucial step of design science research (March & Smith 1995) is the evaluation, the fifth step, which consists of an observation and measurement of the solution's solving capability. This includes a comparison of the previously defined objectives with the observed results. Different possibilities include activities such as quantitative performance measures, client feedback, or simulations. Depending on the capability of the proposed solution, the authors can iterate back to a previous step of the DSRP. Thereafter, the evaluation begins. In this stage, the effectiveness and efficiency of the solution's usability is evaluated. Finally, the sixth step comprises the communication of the whole research process in this thesis (Peffers et al. 2006; Peffers et al. 2008).

3 Publications

3.1 Related Publications

As part of this research, 16 publications have already been produced that directly or indirectly relate to the topic of this thesis. These publications are:

Journal Articles:

- Zolnowski, A., Semmann, M., Amrou, S., Böhmann, T. (2013): "Identifying Opportunities for Service Productivity Improvement Using a Business Model Lens – Lessons From Corporate Education Services." In: Service Industries Journal http://www.tandfonline.com/doi/full/10.1080/02642069.2013.747516

Conference Proceedings:

- Zolnowski, A. (2015): "Designing Services with Business Model Representations - Evaluation of the Service Business Model Canvas." (Manuscript to be submitted).

- Zolnowski, A., Böhmann, T. (2014): "Formative Evaluation of Business Model Representations – The Service Business Model Canvas." European Conference on Information Systems (ECIS), Tel Aviv.

- Zolnowski, A., Weiß, C., Böhmann, T. (2014): "Representing Service Business Models with the Service Business Model Canvas - The Case of a Mobile Payment Service in the Retail Industry." Proceedings of 47th Hawaii International Conference on System Sciences (HICSS-47).

- Zolnowski, A., Böhmann, T. (2013): "Customer integration in service business models." Proceedings of 46th Hawaii International Conference on System Sciences (HICSS-46).

- Zolnowski, A., Semmann, M., Böhmann, T. (2012): "Vergleich von Metamodellen zur Repräsentation von Geschäftsmodellen im Service." Proceedings des Workshops Dienstleistungsmodellierung. In: Thomas, O.; Nüttgens, M.: Dienstleistungsmodellierung (DLM) 2012.

- Zolnowski, A., Semmann, M., Böhmann, T. (2011). "Metamodels for Representing Service Business Models," Proceedings of SIGSVC Workshop. Sprouts: Working Papers on Information Systems, 11(163). 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." RESER Conference 2011. Hamburg.

- Zolnowski, A., Böhmann, T. (2011): "Business modeling for services: Current state and research perspectives." Proceedings of Americas Conference on Information Systems (AMCIS), Detroit.

- Zolnowski, A., Schmitt, A.-K., Böhmann, T. (2011): "Understanding the impact of remote service technology on service business models in manufacturing: From improving after-sales services to building service ecosystems." Proceedings of European Conference on Information Systems (ECIS), Helsinki.

- Zolnowski, A., Böhmann, T. (2010): "Stand und Perspektiven der Modellierung von Geschäftsmodellen aus Sicht des Dienstleistungsmanagements." Proceedings des Workshops Dienstleistungsmodellierung. In: Thomas, O.; Nüttgens, M.: Dienstleistungsmodellierung 2010. Heidelberg: Physica.

Book Chapters:

- Zolnowski, A., Böhmann, T. (2013): "Veränderungstreiber service-orientierter Geschäftsmodelle." In: Böhmann, T., Warg, M., Weiß, P. (eds.): *Service-orientierte Geschäftsmodelle*, Berlin Heidelberg: Springer-Verlag.

- Zolnowski, A., Böhmann, T. (2013): "Grundlagen service-orientierter Geschäftsmodelle." In: Böhmann, T., Warg, M., Weiß, P. (eds.): *Service-orientierte Geschäftsmodelle*, Berlin Heidelberg: Springer-Verlag.

- Zolnowski, A., Böhmann, T. (2012): "Geschäftsmodelle zur kooperativen Entwicklung und Vermarktung von MST-basierten Dienstleistungen." In: Zangemeister, C.: *Mit intelligenter Technik zu neuen Dienstleistungen für Senioren (MIDIS)*, Norderstedt: BoD-Verlag.

- Zolnowski, A., Böhmann, T. (2012): "Geschäftsmodell zur kooperativen Entwicklung technikbasierter Dienstleistungen." In: *AAL- und E-Health-Geschäftsmodelle - Technologie und Dienstleistungen im demografischen Wandel und in sich verändernden Wertschöpfungsarchitekturen*. Wiesbaden: Gabler.

- Böhmann, T., Zolnowski, A., Schmitt, A. K. (2009): "Geschäftsmodelle für Software-Services: Grundlagen und Entwicklungslinien." In: Gronau, N.; Eggert, S.: *Architekturen, Geschäftsmodelle und Marketingstrategien für ERP-Anbieter*, Berlin: GITO-Verlag.

3.2 Included Publications

The research questions are answered in a frame of six publications. In this subsection, these publications are briefly introduced.

Chapter 8:

Citation	*Zolnowski, A., Schmitt, A.-K., Böhmann, T. (2011): "Understanding the impact of remote service technology on service business models in manufacturing: From improving after-sales services to building service ecosystems." Proceedings of European Conference on Information Systems (ECIS 2011), Helsinki.*
WKWI/ VHB Ranking	WKWI: A VHB-JQ: B
Type of paper	Research paper

Aim	This paper investigates the impact of new technologies on service business models in manufacturing industries and thus focuses on a technology-driven transformation of business models. This transformation results in service innovations that change a traditional business model to a more service-based business model.
Methodology	Empirical paper based on qualitative data from 13 expert interviews
Contribution	This paper provides insights into the impact of IT use on the service business models in German-based manufacturing companies. For these companies, services have become increasingly important to compete in global markets. This study traces how the use of IT, specifically remote service technology, enables innovation in service business models. This contribution provides a systematic account of the link between the use of remote service technology and business model innovation.
Co-authors' contribution	The article was co-authored by Prof. Dr. Tilo Böhmann and Ann-Kristin Schmitt. Prof. Böhmann contributed the idea to the paper. Furthermore, he wrote the introduction and revised the conclusion and outlook section. Ann-Kristin Schmitt conducted the interviews, discussed the results, and provided English proficiency support.

Table 2: Summary of appended paper 1

Chapter 9:

Citation	*Zolnowski, A., Böhmann, T. (2011): "Business modeling for services: Current state and research perspectives." Proceedings of Americas Conference on Information Systems (AMCIS 2011), Detroit.*
WKWI/ VHB Ranking	WKWI: B VHB-JQ: D
Type of paper	Research paper

Aim	This paper reviewed selections from business model literature on their ability to represent service.
Methodology	Literature analysis
Contribution	This contribution discovers research gaps in order to outline perspectives, which show the possible development of business model design. Because of the increasing importance of services for many companies and the resulting transformation of product-based business models to service-based business models, the paper focuses on the link between business models and services. Thus, it identifies how the business model construct can provide support for the analysis and design of service business models. Because there is a dearth of literature focusing on service-specific aspects in business models, different research aims can be pursued. These are the investigation of (1) specific objectives such as servitization of manufacturing, (2) the impact of co-creation on the structure of business models, (3) different business model perspectives (front-back logic), (4) the modeling process of business models within new service development, and (5) representation of actor associations.
Co-author's contribution	The article was co-authored by Prof. Dr. Tilo Böhmann. Prof. Böhmann helped me design this paper and derive implications for further research. In addition, he wrote the introduction and revised the conclusion and outlook section.

Table 3: Summary of appended paper 2

Chapter 10:

Citation	*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.*

WKWI/ VHB Ranking	—
Type of paper	Research-in-progress paper
Aim	This paper proposes ideas according to the evidence of co-creation in business model elements and the idea for an adapted BMC.
Methodology	Brainstorming about identified research gaps in Zolnowski & Böhmann (2011)
Contribution	Due to the growing importance of services for many companies and the resulting transformation of product-based business models to service-based business models, the paper focuses on the link between business models and services. For this purpose, the evidence of co-creation in business models is considered and the Osterwalder's BMC is adapted to address shortcomings relating to co-creation of extant business models.
Co-authors' contribution	The article was co-authored by Prof. Dr. Tilo Böhmann and Martin Semmann. Prof. Böhmann contributed the idea to the paper and was part of the brainstorming team. Martin Semmann supported me in the co-creation section with overall feedback and was also part of the brain-storming team.

Table 4: Summary of appended paper 3

Chapter 11:

Citation	*Zolnowski, A., Böhmann, T. (2013): "Customer integration in service business models." Proceedings of 46th Hawaii International Conference on System Sciences (HICSS-46).*
WKWI/ VHB Ranking	WKWI: B VHB-JQ: C
Type of paper	Research paper

Aim	Detailed analysis of customer integration in service business models
Methodology	Case study
Contribution	In this paper, the impact of co-creation on business model representations is examined. Drawing from the BMO by Osterwalder, this paper discusses the impact of co-creation on business models and suggests requirements for the representation of service. For the development of these requirements, service-dominant logic as a theoretical vantage point is applied. In particular, the reasoning of service-dominant logic on value and value co-creation is used to develop requirements for the representation of the extensive integration of the customer into the value-creation process. Finally, it is concluded that a business model approach for service environments must consider the following requirements: (1) a comprehensive representation of relationships between the customer and the entire business model, (2) representation of the customers' share of costs and revenues, (3) representation of the customers' contribution to activities and resources, (4) representation of the specific context of a customer (thereby emphasizing the value creation of the customer), and (5) representation of the relationship and channel between a provider and customer showing how these actors co-determine the interaction between them.
Co-author's contribution	The article was co-authored by Prof. Dr. Tilo Böhmann. Prof. Böhmann helped to elaborate requirements for the representation of service business model.

Table 5: Summary of appended paper 4

Chapter 12:

Citation	*Zolnowski, A., Weiß, C., Böhmann, T. (2014): "Representing Service Business Models with the Service Business Model Canvas - The Case of a Mobile Payment Service in the Retail Industry." Proceedings of 47th Hawaii International Conference on System Sciences (HICSS-47).*

WKWI/ VHB Ranking	WKWI: B VHB-JQ: C
Type of paper	Research paper
Methodology	Case study
Aim	Demonstration of the SBMC
Contribution	In response to the previously derived shortcomings and on basis of the proposed requirements, this contribution offers a representation for service business models. Furthermore, a first evaluation of the SBMC by an informed argument is presented. Within this paper, the utility and efficacy of this alternative business model representation is demonstrated. This is done with a case study of a proximity m-payment service in the German retail industry that applies and compares the BMC and SBMC.
Co-authors' contribution	The article was co-authored by Prof. Dr. Tilo Böhmann and Christian Weiß. Prof. Böhmann gave feedback and helped refine the paper. Christian Weiß collected empirical data from his work at EDEKA. This paper is based on his data. Christian Weiß supported me with information according to the research methodology and discussed the results with me. Furthermore, he wrote the section with the EDEKA case.

Table 6: Summary of appended paper 5

Chapter 13:

Citation	*Zolnowski, A., Böhmann, T. (2014): "Formative Evaluation of Business Model Representations – The Service Business Model Canvas." European Conference on Information Systems (ECIS), Tel Aviv.*
WKWI/ VHB Ranking	WKWI: A VHB-JQ: B

Type of paper	Research paper
Methodology	Empirical research based on qualitative data from thinking aloud protocols
Aim	Formative evaluation of the SBMC and introduction of thinking aloud as a formative evaluation method for the development of business model representations
Contribution	This contribution comprises the application of thinking-aloud protocols for the formative evaluation of the SBMC. With help of industry experts and academics with experience in the service sector and business models, the SBMC's usability is tested and implications for its further development are derived. Furthermore, this contribution provides empirically based insights for the design of service business model representation that can facilitate the development of future business model representations.
Co-author's contribution	The article was co-authored by Prof. Dr. Tilo Böhmann. Prof. Böhmann gave feedback and helped refine the paper.

Table 7: Summary of appended paper 6

Chapter 14:

Citation	*Zolnowski, A. (2015): "Designing Services with Business Model Representations - Evaluation of the Service Business Model Canvas." (manuscript to be submitted)*
WKWI/ VHB Ranking	—
Type of paper	Research paper *(manuscript to be submitted*)
Methodology	Empirical research based on qualitative data from a focus group workshop setting

Aim	Naturalistic evaluation of the SBMC and introduction of focus groups as evaluation method for the development of business model representations
Contribution	This contribution reports on the naturalistic evaluation of the SBMC. For this purpose, a focus group session method was performed that considered the use of the SBMC for designing, understanding, and analyzing co-creation in service business models. To apply SBMC to real people, real systems, and real settings, the session was conducted in a German IT infrastructure and consulting company. Furthermore, this study shows insights into the application of business model representations in the development process of services.
Co-author's contribution	I hold single authorship for this paper.

Table 8: Summary of appended paper 7

4 Theoretical Contribution

4.1 Overall Theoretical Contribution

Business models are a topic of interest in academia and practice. Since 1995, the amount of research publications on business models increased sharply (Ghaziani & Ventresca 2005; Zott et al. 2011). This trend shows the growing importance of research on business models and motivates this research project.

This dissertation is rooted in a cumulative research design and contributes to the fields of business model research, service research, and design science research. The field of tension of this dissertation is depicted in Figure 4.

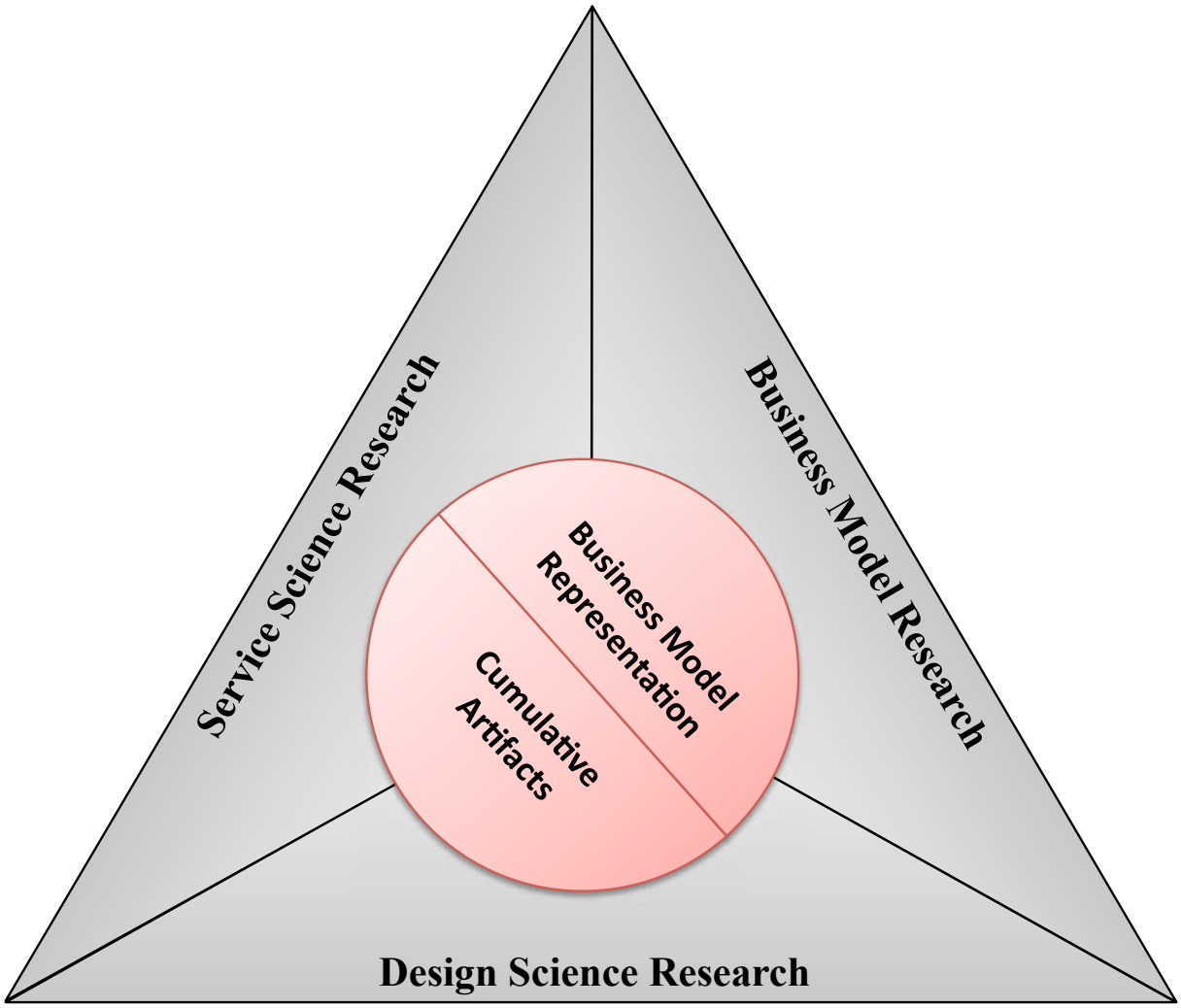

Figure 4: Contribution
Source: own representation

To develop this contribution, research from several disciplines is considered. The essential influence for this contribution has its origin in service science research. Within this field, ser-

vice-dominant logic (e.g., (Vargo & Lusch 2004, 2008), service logic (e.g., (Grönroos 2008a), and customer integration (e.g., (Moeller 2008; Grönroos & Ravald 2009) are most important from a theory-driven perspective. Business model research adds to this thesis by providing business model foundations. These foundations comprise work toward definitions (e.g., (Timmers 1998; Chesbrough & Rosenbloom 2002; Al-Debei 2010), components (e.g., (Osterwalder 2004), taxonomies (e.g., (Rappa 2004), and existing representations (e.g, (Gordijn & Akkermans 2001; Osterwalder & Pigneur 2010). Existing business model ontologies such as Gordijn (2002) and Osterwalder (2004) are also important. Finally, design science research adds to the current work by providing a research paradigm for this thesis (Hevner et al. 2004; Gregor & Hevner 2013). Furthermore, the DSRP (Peffers et al. 2008) adds a concrete research process that is applied in this thesis. Connecting these research fields leads to a mutually beneficial dialogue that allows for the exchange of elaborated knowledge and informs existing expertise with new, additional perspectives.

The overall research contribution can be divided into three contributions. First, this thesis contributes to business model research by proposing a business model representation for service. Within this contribution, knowledge from service logic is connected to the core elements of the business logic that is represented with business models. Moreover, an evaluation method is designed to help successfully develop new business model representations. Second, this thesis proposes a way to translate and operationalize co-creation. To do so, business model thinking helps delineate co-creation of value as part of a general business logic. In addition, service research supplements several examples for an ongoing fundamental, service-driven shift in the business logic of many industries. Third, a cumulative research was conducted. In doing so, an example of cumulative research in and a slight extension of the DSRP tool set is given.

The central contribution of the dialogue between business model research and service science—two previously unconnected research streams—is the SBMC. The SBMC aims for an extensive expansion of the BMC (Osterwalder & Pigneur 2010) to a service-specific perspective. Identified service-specific characteristics, such as co-creation, interaction, and relationship, determine important attributes of a service logic. These attributes must be considered during the analysis, representation, and development of service business models.

4.2 Contributions to Business Model Research

4.2.1 Representation of Co-Creation in Service Business Models

Rooted in a cumulative research design that aims to advance extant business model representations by service, this thesis proposes the SBMC. The SBMC is the main artifact of this dissertation and focuses on the representation of co-creation in service business models. Co-creation, as a service-specific aspect, emphasizes a fundamental shift from traditional one-sided business logic to a two- or multi-sided business logic. Thus, this shift is characterized by an active integration of customers (O'Hern & Rindfleisch 2010) and partners (Grönroos & Helle 2010).

Dealing with the integration of different actors leads to new questions in the analysis and design of a business logic. The SBMC allows for addressing these questions and focusing on the central and strategic elements of co-creation in the business logic of service-based business models. Therefore, it is possible to discuss which parts of co-creation are critical for the success of the business model.

Overall, this research contribution is situated in exaptation research (Gregor & Hevner 2013). Therefore, this thesis considers known solutions from business model research that are applied to new, service-related problems. In doing so, this thesis adds to the body of knowledge by combining the BMO (Osterwalder 2004) and the BMC (Osterwalder & Pigneur 2010) with theory from service science. Thus, this thesis is in line with existing discussions in design science (Niederman & March 2012) and business model research (Zott et al. 2011; Veit et al. 2014) that call for more cumulative research.

The overall logic of the SBMC, as the main artifact, is the contribution to and benefit of the business model for each actor. The explicit addition of a customer perspective allows for the representation of co-creation. In contrast with the value proposition of the BMC, which illustrates the value proposed to customers of the business model, the value proposition in the SBMC allows for representation of the value proposed to each actor, including the focal actor. The customer relationship dimension of the BMC was renamed to “relationship” because it includes the contribution of maintaining the relationship of all actors. Channels are the interaction points between actors. The revenue stream dimension presents possible revenues for each actor. Key resources and key activities represent the each actor’s contribution to service provision. In particular, these dimensions illustrate customers’ contributions to the resources

and the process of providing the service. Finally, the cost structure shows which costs each actor bears as part of the business model (Zolnowski et al. 2014). Because of the recursive character of relationships (the focal company is also the customer of a partner), the co-creation extension is also added to the partner perspective.

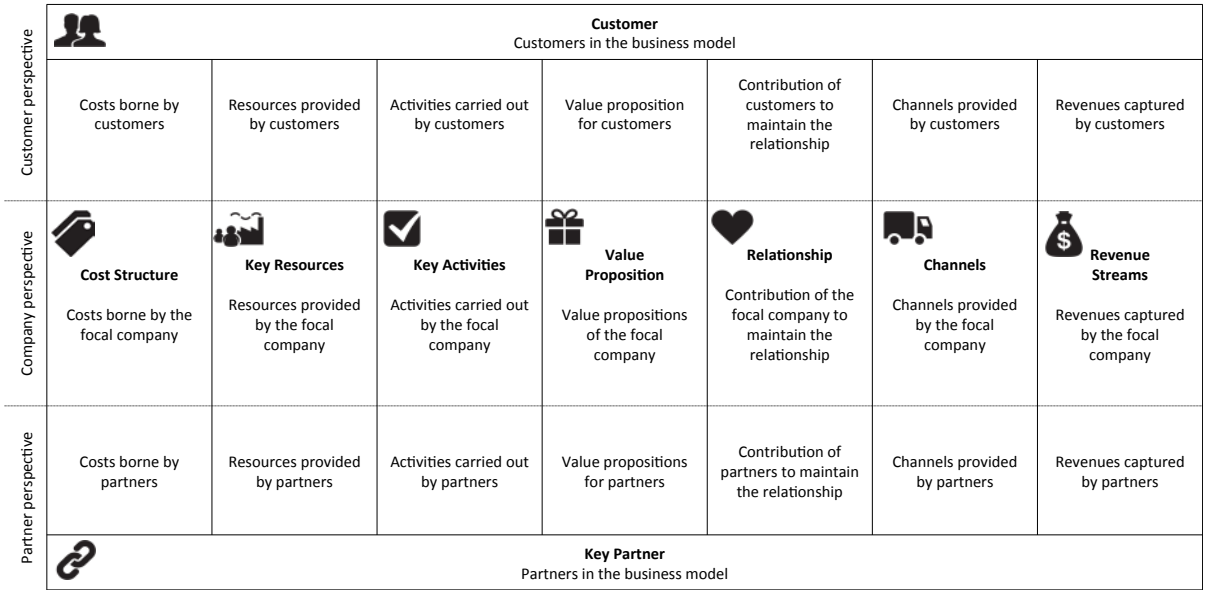

Figure 5: Service Business Model Canvas
Source: (Zolnowski et al. 2014)

In line with this logic, the SBMC represents the influence of different actors on the service business model of a focal company. Thus, a value-in-use or value-in-context perspective is emphasized. According to the different degrees of impact on the business model, the SBMC can represent a wide range of influence. This includes impacts from a simple provision of a resource, to participation in the value-creation processes, to a broad cooperation in all dimensions of the business model. As requested by research, the SBMC integrates the customer perspective into the service development process and thus facilitates a participatory design (Wetter-Edman et al. 2014).

In addition to the traditional, company-centric use of the BMC, the SBMC also allows for a customer-centric application. This is important because customer understanding is often the starting point of a service innovation process (Wetter-Edman et al. 2014). In particular, by positioning the customer in the middle of the SBMC, it is possible to investigate the customer's practices. This includes the application of resources, activities, and outcomes (Grönroos & Voima 2013). From this elaboration, a customer-centric analysis of service business models and their business logic is possible.

The explicit analysis and design of relations between actors helps to overcome the product-centric, traditional value-chain logic of the BMC and to take a network-oriented perspective into account. This enables academics to analyze service business models more comprehensively. Particularly when focusing on the business logic of service, this solution can help develop a better understanding of service-specific characteristics. Consequently, this solution can directly contribute to business model research with its novel, service-specific approach, and to service science by offering a tool for the analysis of service in practice.

4.2.2 Evaluation of Business Model Representations in their Development

The evaluation of an artifact is a central and crucial activity in the DSRP (Peffers et al. 2008). During an evaluation, the output of a research process is examined (Venable et al. 2012) with regard to its utility, quality, and efficacy (Hevner et al. 2004). More comprehensively, Hevner et al. (2004, p. 85) elaborates on the artifact's evaluation in terms of "functionality, completeness, consistency, accuracy, performance, reliability, usability, fit with the organization, and other relevant quality attributes."

In contrast with most representations, which are evaluated by providing illustrative case studies (such as in (Gordijn 2002; Osterwalder 2004; Al-Debei 2010)), this research proposes two evaluation approaches.

First, the thinking-aloud protocol (Ericsson & Simon 1985) as a method for formative evaluations was applied (Zolnowski & Böhmann 2014). The thinking-aloud method considers and analyzes the application of a tool or method by a user. It is based on work in the area of cognitive psychology and widely used in research for the analysis of human behavior. In IS research in particular, the thinking-aloud protocol method is often used for the purpose of usability testing (Boren & Ramey 2000), especially in later stages of a development process (Wonil & Gavriel 2010). While executing this method, it was possible to collect information on the applicability of the SBMC.

Second, at the end of the development process of the SBMC, a focus group (Stewart et al. 2007) evaluation was performed. As a naturalistic evaluation, the artifact faced real people, real systems, and real settings (Sun & Kantor 2006). The decision to conduct a focus group session was made because it is a typical application of business model representations. In doing so, the results of this evaluation show the utility of the SMBC and, thus, that the design artifact achieves its purpose (Venable et al. 2012).

The suggestion of the formative evaluation helps researchers collect rich data about the application of their artifact and thus develop better business model representations. Direct user feedback is recommended, especially for business model representations that are applied in business environments, among others. In addition, the suggestion of a focus group session helps researchers verify the actual value of the business model representation. By executing a naturalistic evaluation, empirical data can be collected that allows for a reflection of the application in a real-world setting.

4.3 Mutual Contribution to Service Science and Business Model Research

In service-oriented business models, the customer is perceived as an integral part of the value-creation process (Zolnowski et al. 2011a). This close cooperation allows for innovative offerings and mutual value creation between customer and supplier (Grönroos & Helle 2010).

To shed light on the integration of the customer and explain the complex nature of service, the service-dominant logic (Vargo & Lusch 2004, 2008) and service logic (Grönroos 2008a) emerged. Using these logics, co-creation can be identified as an important aspect in value-creation processes in service business. Considering literature on value co-creation leads to a multitude of definitions, perspectives, and interpretations of co-creation (Saarijärvi et al. 2013). Moreover, research on value co-creation comprises mainly conceptual work and thus can seldom be applied by practitioners (Lambert & Enz 2012). Even conceptual work needs further investigation of the components of value co-creation (Grönroos 2012).

This thesis adds to service science by applying knowledge from business model research to delineate co-creation of value as part of a general business logic. Business models offer a structure to conceptually express a business logic (Osterwalder 2004) and thus represent a generalized mode of thinking. When applied to service, business models inform reasoning about service logic and its interrelations. The business model construct's wide range of current applications demonstrates that, in general, it is well-suited to support the analysis and design of the business logic of services in many contexts (Zolnowski & Böhmann 2011). In particular, business models offer a system-level holistic view on the business logic of an economic entity or offering. Thus, a business model explains how companies do their business (Zott et al. 2011). In doing so, the dimensions of a business model approach define elements that need to be considered regarding co-creation. Owing to the cumulative research approach,

the BMO was chosen. The customers' integration was investigated and adapted according to the nine dimensions of the BMO (see Figure 6) (Zolnowski & Böhmann 2013a).

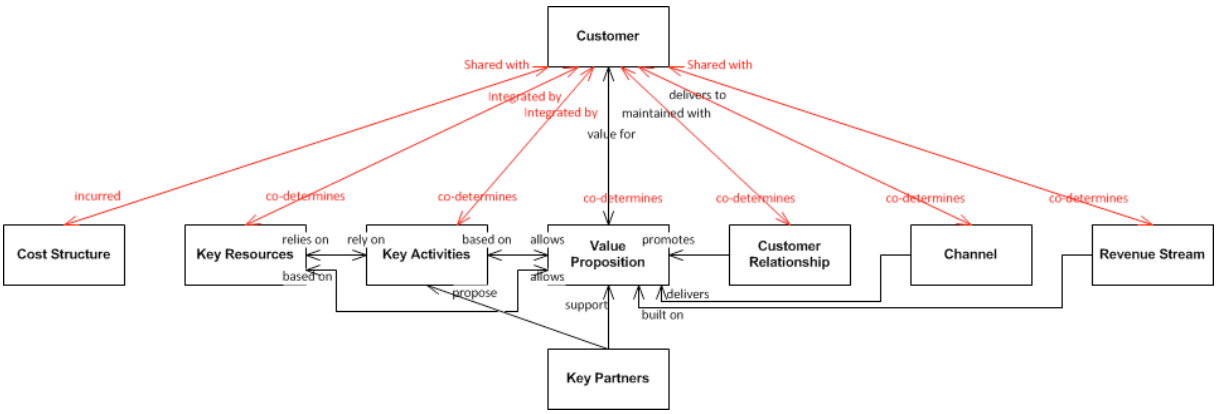

Figure 6 : Analysis of the co-creation according to the nine dimensions of the BMO
Source: own representation (Zolnowski & Böhmann 2013a)

This investigation focuses on the understanding of the coordination of all interactions between customer and supplier in one integrated system (Grönroos & Helle 2010; Grönroos & Ravald 2011). Within this integrated system, a supplier and customer interact in a service logic and generate value for both parties (Grönroos & Helle 2010).

Drawing from fundamentals of business models research, in this investigation, key aspects of co-creation in service business logic are emphasized. This enables co-creation to be reduced to its essential elements in a business logic and thus provides a better understanding of co-creation. In particular, this thesis helps explain how the customer integrates his or her context into the service relationship. The customer's context results in direct collaboration or an individualization of a service offering and, thus, in value in context (Edvardsson et al. 2010; Chandler & Vargo 2011). This helps in understanding the customer's integration of resources and activities as well as his or her decision making by articulating specific needs and wishes.

From this investigation, it is known how the customer integrates his or her resources, overtakes activities, co-determines the value-proposition and value-creation processes, affects the customer relationship, and influences monetary aspect. Overall, this contribution makes value co-creation more tangible and helps researchers analyze co-creation in a more structured and comprehensive way.

Even if existing business model representations provided an elaborated structure with which to analyze the business logic, they are rooted in a traditional, goods-oriented mindset. Thus,

these approaches emphasize a traditional one-sided business logic (Zolnowski & Böhmann 2011). In particular, the application of a business model representation, such as the BMC, emphasizes a company and its contribution to the business model.

According to service literature, "one-sided approaches are theoretically incomplete and misleading as management models and guidelines" (Grönroos & Helle 2010, p. 567). Rather, in a service logic, "customer relationships are the most important gains to be achieved" (Grönroos & Helle 2010). Offerings based on the co-creation paradigm solve problems through an active integration of customer contributions (O'Hern & Rindfleisch 2010). The integration of the customer also considers his or her experiences, logic, and capability to generate value from the application of resources (Grönroos & Voima 2013).

In regard to the service-driven shift in business logic, this thesis links knowledge from service science to the core elements of business models. The implications of this dialogue on business model research are manifold. Business model representations need to illustrate a multi-sided business logic that contains the interactions of different actors. This is important because interactions are essential in service provision and foster value creation (Gummesson & Mele 2010). The resulting value cannot be separated and thus contributes to all actors (Gupta & Lehmann 2005; Grönroos & Helle 2010). Therefore, a differentiated analysis of the value proposition is necessary. Within value co-creation, all actors must integrate their resources in complex activities and interactions (Grönroos & Helle 2010; Pinho et al. 2014). These interactions comprise the application of resources within specific contexts and with actors' specific intentions (Wetter-Edman et al. 2014). For business model representations, this means that activities and resources must be investigated comprehensively for all actors.

The monetary aspects of all actors are also influenced on the basis the respective resources and activities. According to Grönroos and Helle (2010, p.569), this results in "growth and/or premium pricing opportunities and/or cost savings/cost control opportunities" on the customer side and "up-sales, re-sales, and cross-sales opportunities and/or premium pricing opportunities and/or cost savings/cost control opportunities" on the provider side. Thus, a detailed examination of the cost structure and revenue streams is necessary.

In addition, the collaboration itself and, thus, the relationship and channel must be investigated separately. Because of the joint value creation, interactions between the customer and provider occur in different channels. Possible interactions include negotiations, planning, and

advice (Grönroos & Helle 2010). Furthermore, perceptional value dimensions characterize the parties' relationship, so attitudes and performance, attraction to the provider, or customer loyalty can influence the value creation (Grönroos & Helle 2010).

Depending on the degree of customer integration in the life cycle of a service, the customer can have various impacts on the service business model. Alter (2013) differentiates the customer's impact on the business according to several dimensions. These dimensions are assessed on a scale ranging from "Less emphasis in facilitating value creation" to "Greater emphasis in facilitating value creation" (Alter 2013). According to Moeller (2008), the life cycle of a service can be separated into three stages: Facilities, Transformation, and Usage. Analogous to these three stages, Grönroos and Ravald (2009) differentiate Value Facilitation, Value Co-Creation, and Sole Value Creation. Drawing from this differentiation and a case study from the manufacturing industry, requirements for the representation of service business model were derived (Zolnowski & Böhmann 2013a). These requirements translate concepts from service science research—in particular, co-creation—to a business model context. In doing so, co-creation is made applicable to business model research, and thus expertise is added to the body of knowledge. With this knowledge, the representation of service business models can be aligned with co-creation.

4.4 Contribution to Design Science Research

Design science research is a research paradigm that focuses on the development of an innovative artifact and its contribution to the body of knowledge (Hevner & Chatterjee 2010). To apply this research paradigm, the DSRP was developed. It defines how to conduct design science research in IS (Peffers et al. 2008). The nominal process sequence contains six process steps (illustrated in Figure 2). According to this process, an artifact must go through all process steps to be finished.

Rooted in cumulative research design geared toward an understandable representation of service business models, the artifact of this thesis is built on existing business model representations. Thus, the aim was not to develop a completely new business model representation as the artifact but rather to contribute to the knowledge base by extending an existing solution ("exaptation of theories and artifacts to new fields"; Gregor & Hevner 2013, p. 347).

This research proposes an example of how to conduct cumulative research within the design science research paradigm and thus contributes a slight extension of the DSRP tool set to the

body of knowledge. In contrast with the standard procedure, there are some adaptations to the process steps "Objectives of a Solution," "Design and Development," and "Evaluation." The adapted research process is depicted in Figure 7.

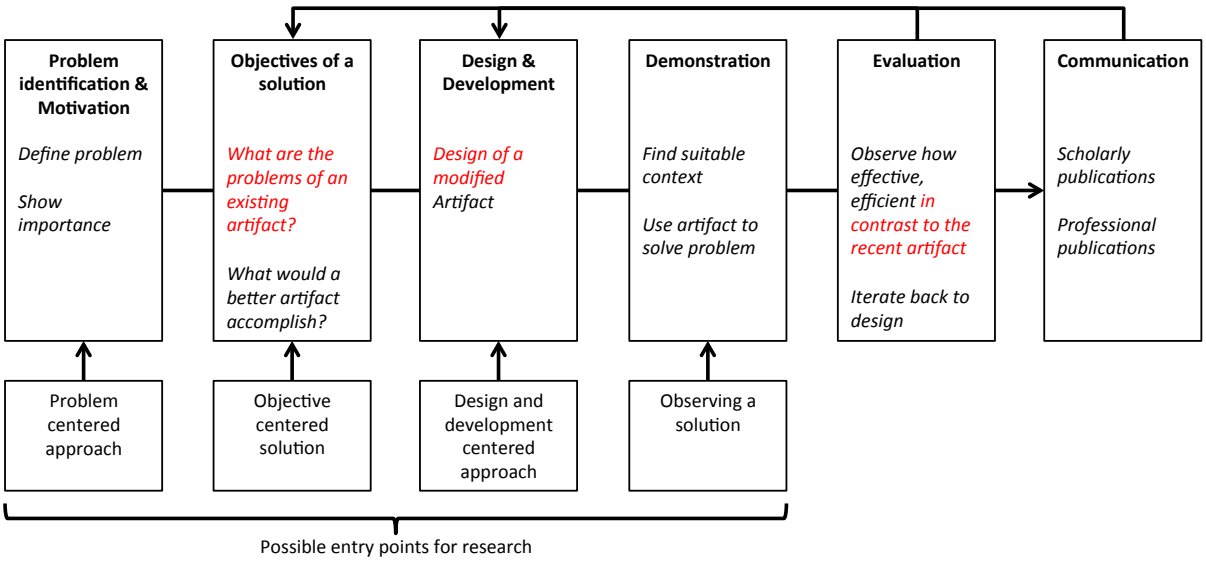

Figure 7: DSRP for cumulative research (adaptations in red)
Source: own representation in based on (Peffers et al. 2006)

In conducting a cumulative research, the process step "Objectives of a Solution" needs a more sophisticated implementation. In addition to asking what a better artifact would accomplish, it is also important to analyze problems of existing artifacts. Furthermore, it is necessary to choose an artifact that must be adapted. Then, on the basis of the identified issues and the derived requirements, a new artifact must be designed. In this process step, the researcher must decide which elements of the artifact should be preserved and which need to be replaced. In addition, the evaluation of the artifact needs more attention. During the evaluation phase, the researcher must assess the adapted artifact in relation to the original artifact.

From this slight extension of the DSRP, researchers can better apply a cumulative research design. This helps systematically integrate existing artifacts and knowledge into the development process of new artifacts and knowledge and thus answers discussions that call for more cumulative research.

5 Practical Contribution

5.1 Overall Practical Contribution

In practice, professionals consider business models an important part of their tool set (Hacklin & Wallnöfer 2012). Business model representations enable practitioners to create consistent conceptualizations of business models (Veit et al. 2014). To do so, there are a broad variety of representations that differ in their aim and structure (Kundisch et al. 2012; Veit et al. 2014).

Drawing from the BMC, the most widely cited representation in the academic literature as well as a broadly applied method in practice, the SBMC offers an adopted business model representation, with which a comprehensive visualization of the business logic of a service is possible. This supports professionals by providing a better tool for the representation, analysis, design, and understanding of service business models. Using this tool, professionals are better able to understand the integration of partners and customers into their business models. This integration has a massive influence on the business models of service offerings. For example, customers must integrate resources to overtake activities or to determine the actual configuration of the value proposition (Moeller 2008; Grönroos & Ravald 2011; Zolnowski & Böhmann 2013a). The SBMC also facilitates strategic thinking in service business. Practitioners are able to understand dynamics and levers in their business logic and to derive possible interventions.

5.2 Providing a Tool for Strategic Thinking in Service Business

The SBMC facilitates the development and management of new service business models by enabling practitioners to analyze, understand, and design strategic decisions and interactions between a company, its customers, and partners (Zolnowski 2015). In doing so, the SBMC offers an approach that focuses on a multi-sided business logic with different actors.

To represent the multi-sided architecture of a service business logic, the SBMC is divided into three perspectives (customer, company, and partner perspective). Although these perspectives increase the SBMC's complexity, they are necessary to explain the involvement of each actor within a business model. Because of the wide spread of the BMC and its uncomplicated application in the practice, the SBMC is developed on basis of the BMO (Osterwalder 2004) and the BMC (Osterwalder & Pigneur 2010). Thus, a business model representation is developed

for practitioners who already know the BMC and can easily adopt and apply it for the representation of service business models (Zolnowski & Böhmann 2014).

The SBMC facilitates strategic thinking in service business. Practitioners can analyze the dynamics and levers of their existing business model according to the differentiated representation of the actors in the business logic. This helps in understanding and extracting the key aspects and interactions of the implemented services. With this knowledge, practitioners can develop strategic decisions to adapt or change their business model or design new service business models. In this process, integration into the existing service portfolio in particular has a high strategic importance. Practitioners are able to evaluate influences and interactions between different services and thus implement a service strategy.

The SBMC also facilitates a customer-centric development of services. Drawing from the customer perspective and, thus, from the customer's needs, wishes, resources, processes, and so on, a company can develop tailored offerings. Alternatively, a company can develop customized instantiations of a service on the basis of a previously defined core service that consists of mandatory business model elements. This helps practitioners evaluate the dependency of a service from customers as well as partners to achieve a better integration into a service system. Furthermore, it helps them evaluate sourcing strategies and the company's service strategy.

5.3 Understanding Customer and Partner Integration

Service business is often characterized by an intense collaboration between the provider and his or her customer. The customer's integration into the value-creation process in particular is a key aspect of service (Vargo & Lusch 2008). Moreover, the value-creation process can be characterized by the collaboration of multiple actors. Within these actor networks, all actors have their own business models with different aims and targets (Vargo & Lusch 2008). These characteristics have consequences for the business logic and business models in practice.

If companies want to introduce innovative service business models (e.g., during servitization; (Neely 2007), they need an overview about the contribution and benefit of a customer within the business model. Moreover, practitioners need to understand partners and how to integrate their separate business models into one consolidated business model (Nenonen & Storbacka 2010).

Regarding a comprehensive understanding of each actor, an important component in this investigation is the desired value. In line with each actor's role, different benefits can occur that lead to a specific value. This value should convince the actor to collaborate actively within the service business model. Collaboration can include the provision of resources and activities and also leads to monetary participation in the business model. In addition, the channels and relationships between the actors should be investigated. This helps foster understanding of the communication between the actors as well as the reason the actors are committed to a specific business model.

With an understanding of the integration of a customer or partner, companies can investigate and differentiate interactions. This forces practitioners to intensively manage co-production and co-creation processes in a service business logic and thus helps improve the overall customer orientation and achieve greater customer loyalty and satisfaction. Furthermore, the understanding of participating business models enables practitioners to design integrated, consolidated business models that take into account the aims and targets as well as the desired value of all actors. This results in mutual advantages for all actors and, consequently, in greater success.

5.4 A Process for using the Service Business Model Canvas

A business model representation that is developed for use in consulting scenarios must be easily understandable and applicable. As previously described, the SBMC is based on the BMC and is thus comprehensible for people who are already familiar with the BMC. Because of the wide adoption of the BMC, practitioners can easily integrate the SBMC into existing processes.

In addition to comprehensibility, the application of the SBMC must also be considered. This occurred during the naturalistic evaluation of the artifact, when the SBMC faced real people, real systems, and real settings. Using this evaluation and other workshops, I propose a process for the application in service innovation processes (cf. Figure 23).

This process is divided into four stages. In a first stage, the current situation of the company's service business and the target of the desired service business are introduced to reflect the company's situation. Using this knowledge, the participants are encouraged to generate ideas for promising services. In a second stage, they must develop service business models for the selected ideas according to previously defined questions (cf. Table 18). The third stage com-

prises the understanding of the developed ideas to generate a common understanding between the participants. In the fourth stage, the participants can discuss the developed business model to prioritize business models for further development.

Drawing from the proposed process and the introduced questions, practitioners can develop service business models in a structured way. This comprises not only a company-focused perspective; rather, practitioners are encouraged to take different perspectives into account and thus to develop a business model that also considers co-creation processes.

6 Limitations

In this chapter, limitations of this thesis and its results are discussed. Typically, limitations result from the chosen research approach, assumptions, research methods, evaluation settings, and the presentation of the results.

Because the research field of business models is rather new, one limitation pertains to the chosen business model understanding. Researchers must decide between myriad business model understandings, definitions, and conceptualizations and choose one perspective that best fits their aims and goals. For this thesis, I decided to define a business model as a holistic view of the business logic of a firm. According to this perspective, a business model is an abstract representation that depicts a set of elements and their relationships to explain how a company creates and captures value (Chesbrough & Rosenbloom 2002; Osterwalder 2004; Zott et al. 2011). In line with this decision, I do not focus on business model approaches that emphasize the process of value exchange (like (McCarthy 1982; Gordijn 2002; de Kinderen & Gordijn 2008; Razo-Zapata et al. 2011)).

Furthermore, drawing on experience with different companies, I observe widespread use of the BMC in the companies' processes. Following calls for more cumulative research on business models (Zott et al. 2011; Veit et al. 2014), I have decided to add to the body of knowledge by advancing the BMO (Osterwalder 2004) and the BMC (Osterwalder & Pigneur 2010). Thus, my focus is on the adaptation of the BMC.

In line with these decisions, I further decided that my research aims to produce an easily understandable business model representation that can be applied in workshops. To achieve this goal, I do not focus on complex networks with a variety of actors. Rather, I focus on a business model representation that considers the key actors in a service business model and thus can be drawn on one page or pin-board. However, the representation of network-based business models could be considered in a future research project.

In the formative evaluation, I analyzed the application of the SBMC to collect data to refine it. The evaluation was conducted according to the 10 + –2 rule by Wonil and Gavriel (2010) that aims to detect 80% of existing usability problems overall (Wonil & Gavriel 2010). With an increase in the sample size of the thinking-aloud tests, it is possible to identify additional is-

sues. However, the identified issues reflect gathered experiences in the application of the SBMC.

Finally, there is a limitation with regard to the naturalistic evaluation of the SBMC. During the design of the evaluation, I had to choose between an artificial and a naturalistic evaluation. In an artificial evaluation, the SBMC would be evaluated in a contrived and nonrealistic way (Pries-Heje et al. 2008). In this evaluation, it would be easier to increase the sample size and collect more data. Nevertheless, I decided to execute a naturalistic evaluation, in which I examined the SBMC in a real organization (Pries-Heje et al. 2008; Venable et al. 2012). Because of time constraints and economic aspects in the target company, it was difficult to conduct several workshops. Therefore, I was able to conduct one workshop in a real service innovation process of a German company. Within this workshop, I selected experts in leading positions with a highly heterogeneous background. The workshop has convinced me that my effort results in advantages in the evaluation process of the SBMC.

7 Implications for further Research

7.1 Network-based Business Models

As described in the limitation chapter, the SBMC focuses on a business model representation that considers the key actors in a service business model. The goal was to create a business model representation that is rooted in a cumulative research design and allows for an easily understandable representation of service business models.

During the research process, I was confronted with service business models that comprise multiple actors. For example, in the case of EDEKA (Zolnowski et al. 2014), two types of customers and three types of partners are involved. Here, the SBMC was able to represent the business model adequately. However, service business models with more actors exist. In this case, the complexity of the SBMC would increase dramatically and the representation would be inconvenient.

To overcome this issue, network-based business models should be considered explicitly with a focus on the interactions between actors. In particular, the problem could be considered from two angles. On the one hand, in line with the logic of the SBMC, research could consider the contribution to and benefit of different actors on the business model of a firm. On the other hand, the business model dimensions of each actor and the connection points between these business model dimensions could be described.

As goal of this research, a business model representation for network-based business models could be developed.

7.2 Transformation and Evolution of Business Models

In addition to the complexity of network-based business models that comprise various actors in direct interaction, the transformation and evolution of business models is of interest. The transformation of business models reflects a triggered change. Potential triggers for the transformation of business models are digitalization, value pricing, and integration. With digitalization, business models need to change because of new technologies; value pricing triggers a free-to-fee transformation of business models: and integration combines previously separate value propositions to customized solutions to gain competitive advantages through differentiation (Zolnowski & Böhmann 2013c). Business model research could examine additional triggers that emerge in business and their impact on the transformation of business models.

A different kind of business model change is the evolution. The evolution reflects the change of a business model over time. Changes can occur because of, for example, altered general conditions, new business challenges, or strategic decisions. Business model research could develop approaches that allow for the representation, analysis, and design of business model evolution. Fritscher and Pigneur (2014) have already proposed first steps. They separate a BMC into layers that represent individual components or time frames in an execution of a business model (Fritscher & Pigneur 2014)

7.3 Collaborative Business Model Development

Another research project could consider the implementation of IT tools for a collaborative development of business models. Other business model representations, such as the BMC[2] and e3-Value,[3] already offer IT tools for the development of business models. However, the support of a collaborative development process is rather limited.

For this reason, IT tools could be developed that support a collaborative development of business models. To do so, innovative technologies could be used that support the communication, cooperation, and coordination (Leimeister 2014) between participants of a design workshop. A feasibility study for this research project has already been initiated. In this research, software was designed that uses multi-touch displays and iPads for the development of service business models. Multi-touch displays served as the center point of the development process and aggregated all users' information. Users were able to connect to a local server and participate with their iPads in the process.

As shown in this feasibility study, collaborative development of business models can be supported by IT. With a software tool and appropriate methods from collaboration engineering (Leimeister 2014), research can help increase the efficiency and effectiveness of collaborative business model development.

7.4 Methods for Business Model Innovation

Business model representations offer a tool that can be applied in a business model innovation process. Within the development process, information must be collected and generated in a

[2] http://www.businessmodelgeneration.com/
[3] http://e3value.few.vu.nl/

structured way. To execute this process, additional methods and tools must be applied that help access the required data. In this thesis, a process is proposed that can be applied in a workshop at a company.

A future research project could focus on the application of the SBMC and the business model development process. Methods from open innovation (Chesbrough et al. 2006) that integrate the customer into the development process could help design and create suitable value for the customer. Lead-user methods, idea competitions, idea communities, and the tool kit approach (Leimeister 2012) enable a company to open its boundaries in the development process and create usable business models.

Furthermore, existing approaches from service engineering (Bullinger & Scheer 2006) and new service development (Edvardsson & Olsson 1996) could be used to enrich business model research by adding structures and methods. In addition, business model research could contribute to service engineering and new service development research by providing tools and structures for the application in development methods.

8 Understanding the Impact of Remote Service Technology

Zolnowski, A., Schmitt, A.-K., Böhmann, T. (2011): Understanding the impact of remote service technology on service business models in manufacturing: From improving after-sales services to building service ecosystems. Proceedings of European Conference on Information Systems (ECIS 2011), Helsinki.

Abstract

We explore the use of remote service technology in manufacturing. The study provides insights into the impact of information technology use on the service business models in German-based manufacturing companies. For these companies, services become increasingly important to compete in global markets. Our study traces how the use of IT, specifically remote service technology, enables innovation in service business models. The study is exploratory, being based on expert interviews with case companies and industry representatives. The study contributes by providing a systematic account of the link between the use of remote service technology and business model innovation.

Keywords

After-Sales Services, IT, Service, E-Service, Remote Service

8.1 Introduction

Services have become a crucial business segment for the manufacturing industry. Through services, companies secure turnover and especially revenue generation in highly competitive markets (cf. Stolz 2006). This also pertains to globally competitive firms from the German manufacturing industry. While in the past, services were considered self-sellers resulting somewhat automatically from product sales, today, more and more companies try to develop and penetrate this market systematically. Product-related services are at the core of these efforts (cf. Markus 2004). Nevertheless, there is a growing number of companies that differentiate themselves by integrated solution offerings that bundle goods, software, and services (hybrid products) and provide added value to the customer (cf. Geier 1999; Böhmann, Krcmar 2007; Knebel, Leimeister, Krcmar 2007).

Despite all efforts, some years ago the share of turnover generated by services seemed to stagnate in the manufacturing industry (cf. Geier 1999). The reasons for this fact are manifold. More recent studies show that the servitization, the transformation from a pure physical goods manufacturer to a solution provider with individual customer services, is still in progress. In a study by Neely (2008) in 2007 nearly 30% of the considered firms were already servitized. However, traditional field services in manufacturing are under increasing pressure (cf. Böhmann, Taurel, Bremerich 2009). Thus, any further improvement of the service business in manufacturing requires a substantial reengineering of service process (e.g. through IT) and the development of innovative service offerings (cf. Davenport 1993; Lay 2009).

Therefore, it is not surprising that IT plays an important role in the development of services in the manufacturing industry (cf. Leimeister, Glauner 2008). Practitioners increasingly discuss the opportunities that remote services can offer. By the use of technology, especially of IT, remote services allow delivering services independent of geographical location. Remote services are specifically complex because they demand both, additional functionality of the machines manufactured by a company as well as an enhanced IT infrastructure that allows the monitoring and controlling of these machines.

Based on the analysis of our cases of successful remote service implementation, this article aims to uncover the impact of the remote service technology on the service business models of manufacturing firms and thus offer a starting point for further research1. Firstly, fundamentals regarding definitions and methodological approach are given. On this basis, the cases are

shortly introduced and impacts of remote service technology on their business models are described. From these findings, propositions are derived regarding the impact the introduction of remote service technology into a company may have on the different dimensions of its business model, structured according to Osterwalder's (2004) model.

8.2 Basics

8.2.1 E-Services

In the following passage, definitions of fundamental terms are given in order to support a deeper understanding of the topic and to outline the basic conceptualization of this article.

According to Wünderlich et al. (2007), e-services can be described using three different characteristics. The authors define e-services as web based services, which deliver a service over the internet in an interactive manner, or as purely informational services, which deliver the benefit of information provision or sharing.

Buhl et al. (2008), on the other hand, differentiate between an economically and a technologically oriented service concept, which are fundamentally different in the characteristics they consider constitutive of service. From an economic point of view, service is an interaction between customers and providers, in which value is generated. Thus, service is a comprehensive term for the business process, which is composed of a potential, process, and output dimension. It manifests itself as an interaction between a service provider and a service customer.

The technological understanding of service is that of an artifact, which is realized using software and offers a functionality. Web services are a specification of these services, if they are loosely coupled, self-descriptive, independent from platforms, can be composed into more complex forms of services (composition), and are based on standards.

E-service links the economic and the technological service concept. In the following, e-service denotes the provision of services using electronic networks like the Internet.

E-services require interconnected information systems. Consequently, services as defined in the technological concept can be employed for the realization of e-services. But this also means that single or composed services from a technological understanding may be offered as e-services.

8.2.2 Remote Services

The synonyms remote service, tele-controlled service, or teleservice refer to one specific kind of e- service. Wünderlich (2009) describes remotely controlled services as deliverables, which are created and delivered in a technologically supported process, independent of the geographical distance between provider and customer. Also, the geographically distant object on which the service is rendered is changed by a control component with a feedback process.

According to Stolz (2006), most definitions of the term remote service agree on three aspects: The service is an industrial one, focusing on machine operations, and is rendered using ICT in order to allow service delivery regardless of geographical location. The industry association of manufacturing in Germany (VDMA) claims that remote services seek to deliver added value to customer through ensuring and enhancing productivity (availability and quality) (cf. VDMA 2005).

Figure 8 depicts an exemplary customer relationship, which may be built with remote services. ICT plays the prominent role of an intermediary and is vital for the realization of an interactive relationship between provider and customer. By using access and controlling technologies the provider is able to remotely access those customer systems, which require modification. In the next step, modification technologies make it possible to accomplish the customer's request for changing system specifications. Measuring technologies are employed in order to control for the success of any modifications made and in order to provide status data on the service object as feedback for the customer.

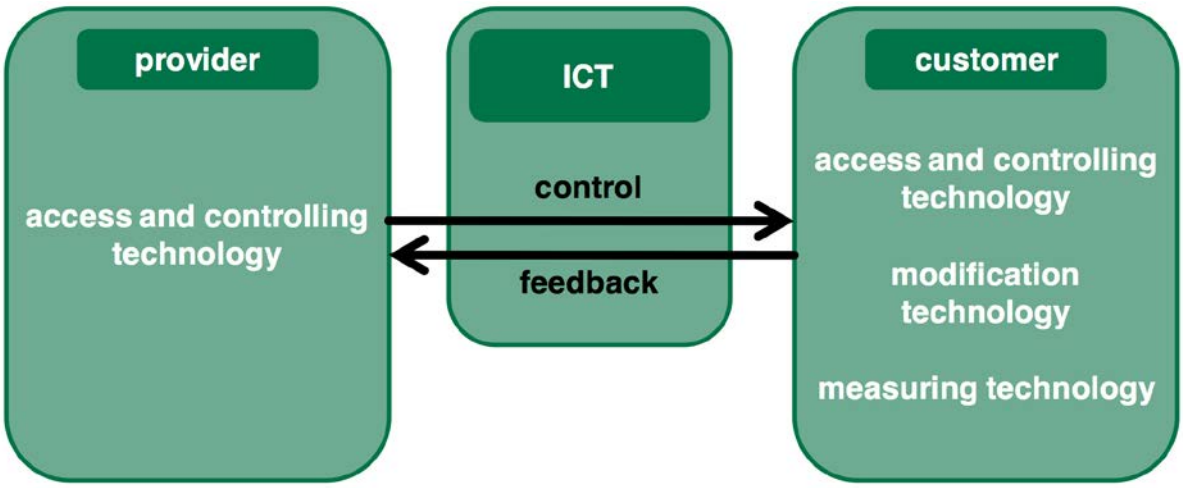

Figure 8: Provider-customer relationship with remote services
Source: based on (Wünderlich et al. 2007)

Remote services substitute face-to-face interaction in the service process for technological mediation (cf. Wünderlich et al. 2007). Through integrating IT infrastructure and sharing data, however, remote services may still provide opportunities for an enhanced co-creation of service providers and their customers.

The integration of the external factor into the service provision is also an important part of a remote service. The provider can directly access the geographically distant service creation and is thus able to make changes to the service object. The data connection employed is bidirectional and gives the provider interactive and synchronous access to all resources required (cf. Wünderlich et al. 2007).

It is also characteristic of a remote service that the interaction between the provider and his customer basically stays on the objective level. More precisely, the interaction spans several levels and especially focuses on the objective aspects that are fundamental in the business relationship as well as on the interpersonal level, which underlies the provider-customer relationship throughout its entire lifecycle (cf. Wünderlich et al. 2007).

8.2.3 Business Models

In order to analyze the impact of remote services on a business model it is necessary to first define the term “business model”. This step is very important because of the huge variety of possible understandings in the literature (cf. Osterwalder 2004; Al-Debei 2010).

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 (2009) also developed the business model canvas (Figure 2.), which represents a visualisation of the business model dimensions.

Because of the systematic and easy use of the canvas, we selected this approach for the analysis of the impact of remote service technology on the service business model.

Osterwalder (2004) posit that a business model can help to describe and to understand an underlying business logic so that we can analyze the impact of a remote service on a business model of a company 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 (cf. Osterwalder, Pigneur 2009). In order to reduce complexity we combine Distribution Channel with Customer Relationship and Key Activities with Key Resources. This does not impact the usefulness of the model for structuring our cases but helps to classify the existing information.

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 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 (cf. Osterwalder, Pigneur 2009).

8.3 Remote Service in the Manufacturing Industry

Data Collection and Analysis

This research is based on expert interviews that were conducted in the context of a research project on business opportunities for e-service on the Internet of Services. The interviews focused on the mechanical engineering and automotive industries. In total, we conducted 13 interviews lasting 60-120 minutes. The experts are selected for their broad industry knowledge of the application of remote services (5 industry experts) or for their in-depth knowledge of the use of remote services in a particular company (8 company experts). Of the

five industry experts, two hold academic position with a research focus on IT applications in the selected industries. The other industry experts represented an industry association, a specialized consultancy, and a vendor of remote service software solutions.

To prepare the interviews, detailed research was undertaken on the current topics and challenges of the respective industries as discussed in scientific research and on the web sites of trade associations. Based on these data, thematic guidelines were developed, which helped to structure the expert interviews. These guidelines for company experts comprised closed questions with regard to basic information on the company and its general offerings of e-services. All guidelines contained open questions that investigated the status quo and the future for remote service and complementary e- services either in the specific company or in the focal industry. In order to gain a deeper insight into the topic, questions about opportunities or challenges of e-services and remote technology and related technological developments and industry trends were also included in the questionnaire.

The subsequent analysis focused on identifying the impact the use of remote service technology might have on the various aspects of a company's business model. For this purpose, the information provided by the industry experts was clustered and examples were extracted. On this basis, propositions were derived regarding the influence of remote technology on a company's value proposition, customer segment, customer relationship and channel, key activities and resources, key partners, cost structure, and revenue streams.

Table 9 shortly introduces five exemplary companies and their remote service portfolio with its specific characteristics that we conducted interviews at in the course of the study.

Company	Basic information	Examples for the use of remote service technology
1	• automotive industry • OEM • several brands • >50,000 employees (2009) • >50 bn. Euros turnover (2009)	• data collected in vehicles and analyzed for vehicle-related after-sales services, to enhance internal knowledge, and improve performance / design • remote services give manufacturer direct access to vehicle and allow repairs or modifications without geographical constraints • e.g., vehicle automatically requests service if maintenance is required • remote services help optimize internal processes (via automation and parallelization), efficiency (cost reduction), and quality

2	• manufacturing industry • internationally leading solution provider in print media sector • >10,000 employees (2008/09) • >1 bn. Euros turnover (2008/09)	• services for all lifecycle stages of printing machines • remote services also allow offering added-value services e.g., for process optimization based on data collected and analyzed from customer's machines • remote services help cutting costs, facilitate competitive differentiation, and allow tapping new revenue potentials
3	• manufacturing industry • systems for continuous production processes • >10,000 employees (2009) • >1 bn. Euros turnover (2009)	• collection and analysis of customer data are automated and help to enhance customer knowledge and develop (new) products and services tailored exactly at the customer's needs • remote services and individualized offers facilitate direct contact and put competitors at a disadvantage • remote services decrease maintenance costs and time requirements
4	• manufacturing industry • broad range of technologies and markets • globally operating • >100,000 employees (2009) • >50 bn. Euros turnover (2009)	• remote services used for a variety of different models • e.g., simple problem solving via remote connection; fostering knowledge exchange and solving availability problem of a small number of geographically dispersed experts; comprehensive concept for operating and servicing a plant/solution (i.e. build-own-operate-transfer-model)
5	• manufacturing industry • specialized provider of intralogistics systems • <500 employees (2008) • <200 bn. Euros turnover (2008)	• portfolio comprises entire chain, including plant layout, construction as general contractor, integration of inventory software, and after-sales services • after-sales services based on remote services e.g. plant monitoring, operator support, and software management • remote services allow for the development and provision of innovative services

Table 9: Brief description of exemplary companies and their use of remote service technology

8.4 The Impact of Remote Services on the Business Model

8.4.1 Impact on Value Proposition

The introduction of the remote service technology can have substantial effects on the products and services a company offers. For example, it may help to develop new offers or to extend the existing portfolio.

The development of new products and services can be supported by the usage of remote service technology. Our cases provided a lot of different examples for the potential for supporting innovation.

Company 2 uses the technology to establish new product extensions for their old printing machines. An application store offers the customer the possibility to download new extensions for their existing products. The company is able to design new software products for the support during product lifecycle of its printing machines and to install them via remote connection.

Another example can show us a different impact of remote services on an existing business model. Company 3 collects information via remote services and analyzes it with the aim of developing some new offers to the customer. The company can detect gaps in the service process of the client. Having identified such a gap, the company then helps its client to close it by restructuring or optimizing the client's processes. Especially for clients in the food industry, for instance, a small process improvement in their production line could result in high savings. Additionally, the company in our case offers its customers access to its knowledge database. In view of these aspects, we propose:

P1a: The use of remote services facilitates the offering of process-related services in addition to product-related services.

P1b: The use of remote service technology delivers the information needed to offer business process optimization services.

A second impact remote service technology can have on the value proposition of a company is that it can be employed to extend or support an existing product. Being able to offer expert input even in remote locations can increase the perceived value of products considerably. Therefore, company 4 established remote technology to increase expert availability and to simplify knowledge exchange among its experts. Overall, these improvements help to raise service quality. Examples for this application of remote technology can be found in any of our cases.

Also, an automation of service processes can be realized via remote services. For example, this is achieved by automated monitoring of product conditions, like in company 2 and 5. Condition and process monitoring can provide important information, which may prove use-

ful for other processes as well. This way, company 2 is able to offer special services throughout the complete lifecycle of its printing products. All of these services can increase individualization of products and, thus customer satisfaction. Furthermore, information collected can be used to improve product properties, as is the case in companies 2 and 3. Consequently, we posit the following proposition:

P1c: Remote services strengthen existing customer service (effect on service quality) through extending the access to expert knowledge and enabling proactive services.

8.4.2 Impact on Customer Segment

The companies studied focus the use of remote service technology predominately on existing customers. By reducing the overall reaction time and automating many processes the use of remote services can increase customer satisfaction and loyalty.

However, a few companies also try to leverage remote services to expand the existing customer base. A customer of company 1 has to sign a service contract for the whole lifecycle of the product, in this case the automobile. The contract ends with the car being sold or taken out of service. If it is sold company 1 has the opportunity to contact the buyer and to offer him a new service contract. If the buyer is interested in using all features his new car offers he will sign the contract and company 1 will get a new client.

Another example can be found at company 4. This company uses the remote service technology for internal purposes and, in addition, it sells this technology to its customers. Especially the selling helps to finance the remote service technology and to get additional revenues from new customers. According to the shown examples, we propose:

P2a: The use of remote service technology can help to increase satisfaction and loyalty among existing service customers.

P2b: The use of the remote service technology can help to acquire later generations of product owners as service customers.

P2c: The development of remote services competence can help to acquire new customers for remote service technology and infrastructure.

8.4.3 Impact on Customer Relationship and Channel

A review of possible impacts of remote services on the dimensions Customer Relationship and Channel shows that this technology can be a way of establishing direct customer contact. This contact may in turn offer the chance to sell new special products or services to the customer. In cases 1 and 2, the companies have developed an application-store where the customer can buy new services or features for existing products, e.g. support systems for the car driver. Another example for a direct customer contact can be found within company 2 as well. Via an E-Call-Interface (emergency button) on their installed printing machines employees of the customer can establish a direct connection to the company. However, in order to be able to use these features, an Internet connection must be available at the company's site. Therefore, we propose:

P3a: The use of the remote service technology helps to intensify the direct contact to the customer.

P3b: The use of remote service technology provides a platform for the simple acquisition and delivery of software-based services.

8.4.4 Impact on Key Activities and Resources

Another area of the business model of a company that may be affected by the introduction of remote services is subsumed under Osterwalder's dimension Key Activities and Resources. Using this technology, a company is able to gain data on the current status of its installed base. An example for this effect can be observed in case 2, where information is collected and analyzed continually in order to speed up and simplify internal processes and service delivery. Similarly, company 2 also parallelizes parts processes on the basis of the status data it has analyzed. This way, the structure of the processes as well as the processes themselves can be improved. Thus, we propose:

P4a: The use of the remote service technology increases process automation of a company.

P4b: The use of the remote service technology fosters parallelization of the processes of a company.

Furthermore, the collection and analysis of remote data enlarge the information a company has about its customers. For instance, Company 3 acquires knowledge on its clients and uses

these insights offer support, training, and consulting that is specifically tailored to the individual needs of each customer. Consequently, we posit the following propositions:

P4c: The use of remote service technology for data collection increases the knowledge a company has about its own and its customers' processes.

P4d: The use of remote service technology fosters process optimization within the company itself as well as within its customers' organization.

P4e: The data collected through remote services improves the product development process.

A fifth impact that the introduction of remote service technology was found to have with regard to Key Activities and Resources can be seen in company 1. In order to fully make use of the possibilities offered by remote services, the company needs to enlarge its resources by adding further technology for connecting to its installed base and – across that – to its customers. An example of this kind of technology is the Bluetooth or wireless communication this company uses in its automobiles.

P4f: The use of remote service technology causes a need for new resources in a company.

P4g: The use of remote service technology requires IT integration into the customer production technology

8.4.5 Impact on Key Partners

The next dimension of Osterwalder's business model refers to Key Partners. By using remote service technologies a company can establish direct contact to its customers. Consequently, some of the company's partners may become unnecessary. In all our cases, number of service orders placed with partners could be downsized when remote service technology was introduced. However, a physical malfunction cannot always be solved remotely. In these cases, a company should be able to retreat to a working partner network or to its own branches. Thus, we propose:

P5a: The use of remote service technology may help reducing the number of service orders placed with the partners of a company.

Additionally, the use of remote technology may also require a company to find new partners that help it to establish or strengthen the link between the company and its customers. Thus,

there are new types of partners, which must again be integrated, like telecommunication providers or mobile phone manufacturers (as with company 1).

P5b: The use of remote service technology requires the integration of new partners.

8.4.6 Impact on Cost Structure

Studying our cases, we could also observe that the introduction of remote services into a company influences the level and the structure of its costs. Cost savings are mainly the result of a substantial part of the relevant installed base being covered by remote service technology. In order to achieve this, however, remote service technology must be added to most new and as much as possible to existing products. This way, product costs, product development costs and retrofit costs are increased. For instance, Company 4 was able to cut its costs for on-site service firstly, by decreasing the number of cases, which required actual physical presence of a service technician and secondly, by increasing the efficiency of those on-site service calls that still proved to be necessary. Furthermore, the company was able to realize cost cuttings through a decrease in the number of dissatisfied customers, i.e. service costs in the area of service recovery, customer retention etc.. Nevertheless, these savings in service costs have only become possible through investments into the connectivity of the installed base the company serves. Consequently, we propose:

P6: The use of remote service technology reduces the service costs of a company.

8.4.7 Impact on Revenue Streams

The seventh dimension of the Osterwalder business model underlying our analysis is Revenue Streams. With regard to this area, we have found that the companies examined for this article could add new revenue streams from innovative products or services. The ways for this were manifold, e.g., company 3 designed new services on the basis of information gained from its remote service contacts. On the other hand, Company 5 devised much more comprehensive service contracts for its intralogistics systems, while company 4 even developed entire build-own-operate models including many different services and products from its portfolio. Thus, one may say that remote services can also serve as an enabler for new pricing models like pay-for-performance, which is behind build-own- operate-transfer models. Also, in some cases the remote channel is employed as a new distribution channel, especially for selling after sales services, e.g., applications for existing machines or automobiles.

Moreover, in the case of company 4, an increase in customer satisfaction could be realized which in turn impacts the sales volume of the company positively. One important factor for this is the fact that remote services have helped the company to provide its customers with the services they expect more quickly and to better fit its offers to each customer's individual needs. Therefore, we propose:

P7a: The use of remote service technology increases revenues from new products or services.

P7b: The use of remote service technology serves as an enabler for new pricing models.

P7c: The use of remote service technology positively influences the revenue generated by existing contracts.

8.5 Conclusion and Outlook

The exploratory analysis shows that the use of remote services has a wide range of impacts on the service business models in the case companies. Using remote services supports manufacturing firms to improve traditional after-sales services and enables these firms to move into new services-led business models. A key enabling factor for business model innovation is the ongoing access to the installed base of machines and systems as well as the ability to collect and analyze machine data when in use. Figure 9 summarizes the findings.

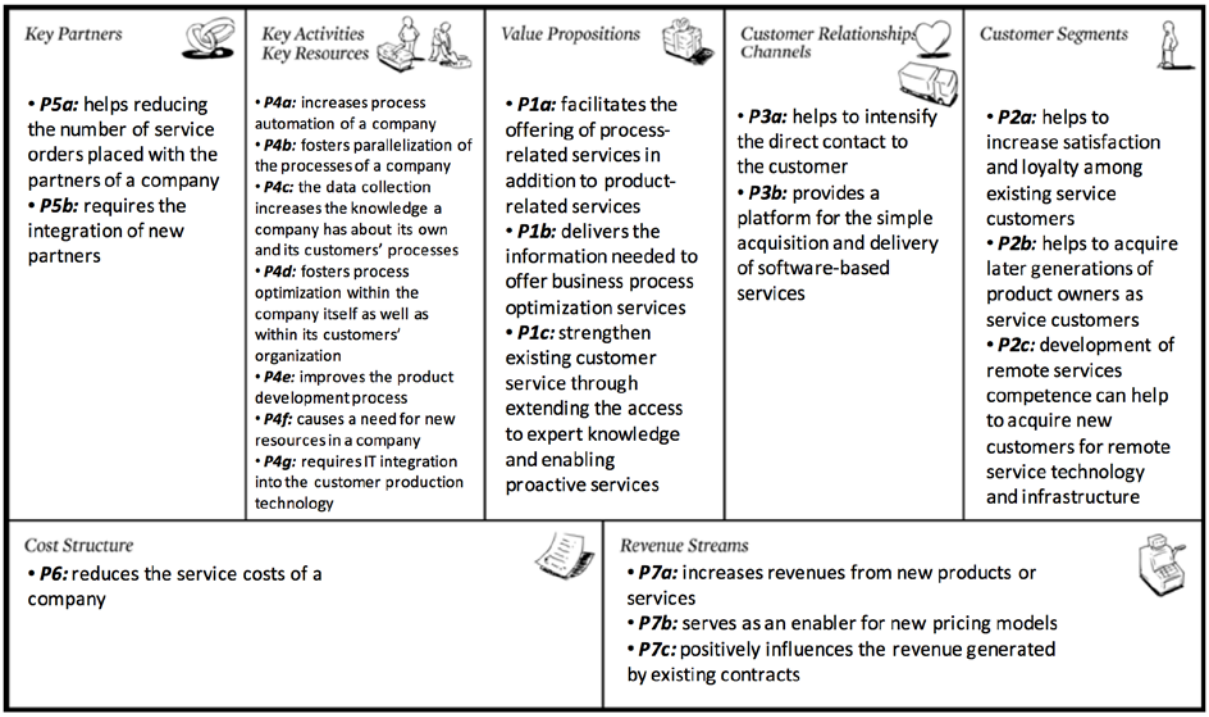

Figure 9: Impact of remote service technology on service business models in manufacturing
Source: based on the business model canvas of (Osterwalder 2004)

In terms of this transformational impact of the use of remote services on business models, the cases point to three different foci. Each of these foci is linked to a set of effects of the use of remote services on the business model. These foci are: (1) improving traditional after-sales-services, (2) enabling solutions, and (3) building service ecosystems. Each of these foci is shortly discussed:

(1) *Improving after-sales-services* summarizes effects that improve efficiency (P4a, P4b, P5a, P6), international reach (P1c) as well as quality and customer satisfaction (P3a, P2a) of established product-related services. Remote services provide the technology to reengineer or automate after- sales services for better quality and lower cost. The result of this is incremental innovation that enables firms to better penetrate their established markets (P7a, P7c).

(2) *Enabling solutions* is a second focus of the effects of using remote services. Here, remote service provides the technology and, more importantly, the data to extend the service portfolio to process- related services (P1a, P1b, P4c, P4d). Together with a manufacturer's products, process-related services are required for building solutions with measurable impact on key performance indicators of the customer's business processes (Tuli et al. 2007). Remote services thus enable business models based on the integration of products

and services for which revenues are based on the actual performance of processes and/or systems (P7b, pay-for-performance).

(3) *Building service ecosystems*, in contrast, focuses on using remote services as a platform to deliver packaged software-based services (P3b). In this case, customers can easily acquire and tailor additional value-added services for products and processes through remote service links. As indicated by our case research, manufacturers could potentially open these platforms to external partners in the same way as companies such as Salesforce.com or Apple have done in the software industry (P5b, P4f). Such open platforms would effectively turn products into foundations for a service ecosystem (Barros/Dumas 2006; Riedl et al. 2009).

Our exploratory research thus indicates that remote services could become a transformational force in the manufacturing sector over and above incremental innovation in traditional after-sales-services business models. Nevertheless, this research provides only a starting point for further research. The next step includes the development of our propositions to empirically examinable hypotheses followed by an empirical survey. Such a study could also further investigate the changing nature of customer relationships through remote services. One of the conditions for the use of remote services is the readiness of customers to share some data on the use of machines with the vendor of the machine. This raises concerns for security and privacy. Studies on the privacy policies and reputations could yield data on how providers of remote service address customer concerns and how exchanging data evolves customer relationships.

This research contributes by exploring the impact of IT-enabled innovations on service business models of manufacturing firms. We provide a systematic account of these impacts and derive propositions from this analysis that can guide future research in this area. Moreover, we summarize these effects into three potential foci of business model innovation in manufacturing firms enabled through the use of remote services.

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9 Business modeling for services: Current state and research perspectives

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Abstract

This paper reviews business model literature from the perspective of extant business modeling approaches in order to discover research gaps and to outline perspectives which show the possible development of business model modeling. Due to the growing importance of services for many companies and the resulting transformation of product based business models to service based business models, the paper focuses on the link between business models and services. Thus the paper identifies how the business model construct can provide support for the analysis and design of service business models. The contribution ends with a brief discussion of missing service-related aspects.

Keywords

Business model, literature review, modeling

9.1 Introduction

Services are a key driver of growth and profitability for many companies (Chesborough and Spohrer 2006). Particularly firms in technology industries, such as IT, aerospace, medical technology, and automotive capture an increasing share of their income and profits with services (Neely 2008). For these enterprises, services thus have become an essential part of their business models. This leads the companies to transform their product based business models more and more to service based business models.

Business modeling allows analyzing, developing and comparing different value creation approaches (Osterwalder, Pigneur and Tucci 2005). As a consequence, business modeling could help companies to develop novel approaches to creating and capturing value with services. This paper therefore examines current approaches to business modeling with regard to the support these approaches provide for the analysis and design of services. The special focus on business modeling and service business models distinguishes this paper from existing literature reviews like Pateli (2002) or Conte (2008).

The paper is structured as follows: we first introduce criteria for comparing different business model approaches, followed by a brief exposition of the compared approaches1. Then, we discuss a detailed comparison of business modeling approaches according to the criteria introduced in the first section. For each criterion we discuss how business modeling could support the analysis and design of service business models. Finally, we derive conclusions for future research on service business models based on the discussion.

9.2 Comparison Criteria and Examined Approaches

9.2.1 Comparison Criteria

The following section introduces comparison criteria to examine the current state of the business model discussion as well as to determine the support of extant approaches for service-specific aspects. They derive from the main research views on business models, enumerated by Pateli (2002), and should consider in particular the modeling aspects of business models.

The chosen criteria are the objectives of business modeling, the structure of the business model, the modeling process, and the representation of the business model. These criteria are not specific to services. For each criterion, however, we highlight aspects that are critical for

analyzing or developing service business models in the detailed discussion of the criteria in the subsequent review of the extant approaches.

The first criterion is intended to capture the **objective** of the considered literature and to discover the overall targets of each approach. Based on this criterion it should be examined for what purpose the respective authors described, analyzed and compared business models. At the same time it should be reviewed, how and what for the business model is used.

The second criterion describes the **structure** and the elements of a business model as well as the relationships between those elements. The structure should be considered exclusively, because there is no general accepted definition of the business model construct so far and it is possible to discover differences between each of the sources. The identified expression for this criterion is also called a business model element.

The third criterion of this study analyses the possible **modeling processes** in the development process of business models. This is a specific definition of a procedure or process, which is used to structure the design of a business model.

The type of **representation** is the fourth criterion of this analysis. At this point it should be examined whether there are approaches for a structure for the representation of business models. A standardized representation of business model elements can be used in particular in the modeling of business models.

The detailed topics of the four criteria iteratively derive from reviewing the papers.

9.2.2 Examined Approaches

The following section presents briefly the considered approaches we reviewed. The first approaches were selected pragmatically during a general search. Building on this foundation, we analyzed reference lists and selected other approaches. All of the selected approaches give a definition of the term business model. Moreover the business model construct is used as a main part of the contribution.

Table 10 gives a short summary of the selected contributions.

Sources	Summary
Timmers, 1998	In the early stage of business model theory development, Timmers (1998) develops a framework for classification of Internet electronic commerce business models. He considers in particular which emerging business models exist and which strategic marketing approaches can be used.
Ethiraj, Guler and Singh, 2000	Ethiraj et al. (2000) investigate the influences of "[...] Internet and electronic technologies [...]" (Ethiraj et al., 2000), in terms of general market movement and changes in the value chain in order to present possible opportunities for the creation of new businesses.
Zimmermann and Alt, 2001	Zimmermann et al. (2001) deal with the different perspectives on the construct of the business model. They examine different definitions of business models and establish a structure to identify their critical elements.
Gordijn and Akkermans, 2001	Gordijn et al. (2001) introduce a conceptual methodology for modeling business models called e3-value™. This should lead to a better understanding and better communication of business models.
Chesbrough and Rosenbloom, 2002	Chesbrough et al. (2002) investigate the role of business models in the capturing of technology based value. In particular, the origins of selected subsidiary of XEROX PARC are considered.
Slywotzky and Morrison, 2002	Slywotzky and Morrison (2002) analyze the experiences of successful business ideas and business models in order to derive ideas for future business models.
Hedman and Kalling, 2003	Hedman and Kalling (2003) define a business model concept to explain the relationship between information systems and business strategy.
Amit and Zott, 2004	Amit and Zott (2004) consider the design of organizations and analyze the impact of the design of business models on the company's success. Therefore, they made an empirical study on 190 young and growing companies.
Osterwalder, 2004	Osterwalder (2004) examines how business models can be described and illustrated. He aims to develop a basis for generating new concepts and tools. The results of his work should be implemented in computer-based tools.
Amit and Zott, 2006	Amit and Zott (2006) analyze the compatibility between the marketing strategy of a product and its business model. The paper is based on an empirical study of 170 randomly selected companies.
Harreld, O Reilly and Tushman, 2007	Harreld et al. (2007) describe the transformation of IBM and its management in a time of crisis, to have a successful new start and how dynamic skills helped in this situation.
Ballon, 2007	Ballon (2007) develops a theoretically framework for the development and analysis of business models for systems and services in the (mobile) information and communication technology.
Candrasekra, 2008	Candrasekra (2008) studies how to adapt existing business models of mobile operators to prepare them for future mobile technologies and other trends.
Bask, Tinnilä and Rajahonka, 2010	Bask et al. (2010) analyze service strategies, service-related business models and business processes in logistics services.

Table 10: Examined Approaches

9.3 Results of the Analysis

Table 11 shows the results of the comparison with regard to objective, structure, modeling process and representation. The criteria described in Chapter 2 are shown in the columns whereas the approaches are listed in the lines.

	Objective						Structure									Modeling process		Repre-sentation	
	Classification and analysis	Innovation	Performance Measurement	Business Model Theory	Modeling Theory	Reconfiguration of the value chain	Value proposition	Value appropriation	Funding and costs	Customers	Networks and activities	Technologies, resources and skills	Strategy, scope, sustainability and leadership	Value flow	Legal	Questions	Graphical structuring	Data model	Graphical
Timmers (1998)	√	-	-	√	-	√	√	√	-	-	√	-	√	-	-	-	-	-	-
Ethiraj et al., 2000	-	√	-	-	-	√	√	√	√	-	-	-	√	-	-	-	-	-	-
Zimmermann et al., 2001	-	-	-	√	-	-	√	√	-	√	√	√	√	-	√	√	-	-	-
Gordijn et al., 2001	-	-	-	-	√	-	√	-	-	√	√	-	√	√	-	-	√	-	√
Chesbrough et al., 2002	-	√	√	-	-	-	√	√	√	-	√	-	√	-	-	√	-	-	-
Slywotzky et al., 2002	√	-	-	-	-	-	√	√	-	√	(√)	-	√	-	-	√	-	-	√
Hedman et al., 2003	-	-	-	√	-	-	√	-	-	√	√	√	√	-	-	√	-	-	-
Amit et al., 2004	-	√	√	-	-	-	√	-	-	-	-	-	√	-	-	-	-	-	-
Osterwalder, 2004 Osterwalder et al., 2010	-	-	-	√	√	-	√	√	√	√	√	√	-	-	-	√	√	√	√
Amit et al., 2006	-	√	√	-	-	-	√	-	-	-	√	-	√	-	-	√	-	-	-
Harreld et al., 2007	-	√	-	-	-	-	√	√	-	√	-	-	√	-	-	√	-	-	-
Ballon, 2007	-	-	-	√	-	-	√	√	√	√	√	√	√	-	-	-	-	-	-
Candrasekara, 2008	-	√	-	-	-	-	√	√	√	√	√	√	-	-	-	√	-	-	-
Bask et al., 2010	√	-	-	-	-	-	√	√	√	√	√	√	-	-	-	-	-	-	-

Table 11: Objective, structure, modeling process and representation
source: own representation

9.3.1 Objective

In the extant literature, we identify a total of six different objectives for using the business model construct. The first objective is **analysis and classification**. One way of using business models is to analyze existing businesses and to identify classes of business models that have emerged in an industry or a market. A second objective is the use of business models as part of the **innovation** process within organizations to stimulate the improvement or design of business models as well as to evaluate ideas for new products and services. A third objective is the investigation of the relationship between business models and business performance.

Through the identification of critical success factors the business model construct can be used for **performance measurement**.

A fourth objective focuses on **business model theory** itself. This discussion seeks to create a universally accepted definition of business models and structures, which can systematize the modeling process of business models. The fifth objective covers the **modeling theory**. This should create structures that can be used to generate a business model.

Finally, business models are used to examine the impact of significant changes in industry. One of these impacts is the **reconfiguration of the value chain** through new business models, e.g. through disintermediation or re-intermediation.

The first topic uses the business model construct for classification and analysis of existing structures and businesses. Timmers (1998) first defines the essential elements (dimensions) of a business model and examines with these dimensions electronic markets for possible classes of business models. As a result he receives classes of business models such as e-shop, e-procurement, e-auction and many more. Slywotzky et al. (2002) examine the structure of existing companies in order to derive their business model. Bask et al. (2010) examined the relationship between service strategies, service business models and business processes in enterprises.

The most commonly discovered topic in the literature review is the design of business models as part of the innovation process. Ethiraj et al. (2000) primarily consider the value chain and the opportunities that arise through an innovative business model. Chesbrough et al. (2002) describe by the example of the Xerox PARC, the introduction of innovation by setting up new businesses. Based on the history of IBM, Harreld et al. (2007) introduce the need for change in a company and the use for that business model construct. Candrasekara (2008) creates a framework for the successful integration of new technologies in the business models of mobile phone companies. Amit et al. (2004, 2006) follow the implementation of innovations with the aim of developing something new or improving current efficiency. Overall the use of the business model construct for the design of innovation is a central part of the business model discussion. Through modeling alternative business models, the development of innovation can be particularly supported.

Another topic of the considered approaches is the relationship between business models and performance. In particular, the investigations of Amit et al. (2004, 2006) should be mentioned which analyze the effects of different business models on firm performance.

Another large group studies and discusses the business model theory itself. The theory discussion adds the basis for the further use of the business model construct. The main reason for the theoretical discourse is the lack of a general accepted definition of the term. Osterwalder (2004) provides a comprehensive literature review on the term business model and developes a wide definition. In an earlier paper Ballon (2007) discusses an extended form of the business model construct where it is expanded by the new business network dimension. The e3-value TM approach of Gordijn et al. (2001) and the BM2L approach of Osterwalder (2004) discuss two different approaches of the presentation and modeling of business models. To assist its design each author presents a different notation of the business model.

The last objective focuses on value chain reconfiguration. Timmers (1998) and Ethiraj et al. (2000) show how new business models can be established by disintermediation, re-intermediation or reconstruction of parts of the value chain.

9.3.2 Structure

Overall, the structure of a business model construct can be summarized by nine elements. The first and most prevalent element of the structure is the **value proposition**. This element is intended to describe how value is created for the customer. The second element is **value capture**, defining the revenue model. The third element can be summed up under **funding and costs**. This element considers the financing and cost aspects of a business model. The fourth element identifies the target **customers**. The elements **networks and activities** examine the activities within a company or a network of different companies required to implement the business model. **Technology, resources and skills** are the fifth element and define the prerequisites for implementing the business model. The sixth element describes **strategy, scope, sustainability and leadership** and therefore the strategic aspects of a business model. Some add the value flow meta model Gordijn et al. (2001) as a seventh element, specifying the exchange **relationships** between different business actors. Finally the eighth element considers the **legal** aspects of the business model.

The value proposition is the central element of any business model and is established by all authors. Value capture is another important element of the business model even though it is

not defined by all authors. Those who address value capture also add other financial aspects such as funding and costs.

Two other very prevalent elements are customers as well as networks and activities. The identification of target customers is widely seen as an essential aspect of business models. This also pertains to key activities for implementing a business models as well as the network of partners needed for this implementation. However, it should be noted that Slywotzky et al. (2002) do not consider this element directly. Less frequently used are elements related to technologies, resources and skills as well as to strategy, scope, sustainability and leadership as a further part of the business model.

The final business model elements contain items that were mentioned only once. This means that these items usually correspond to a very specific view of the author. The elements of the business model by Gordijn et al. (2001) are defined by a strong value-driven vision that is summarized in a value flow meta model. The meta model distinguishes itself with its individual elements, like the value interface, value exchange, value port and value object. All other elements by Gordijn et al. (2001) could be associated with the previously mentioned elements. Finally, Zimmerman et al. (2001) introduce the legal element, which is, however, not mentioned by other authors.

Researchers and practitioners use the business model construct in a wide range of industries, e.g. IT, telecommunication and media. This demonstrates the wide applicability of the business model construct, irrespective of the focus on products or services. However, the structural elements of the extant approaches provide different levels of support for capturing the business logic of services.

9.3.3 Modeling Process

In a narrow sense no dedicated modeling processes for the creation of business models can be found. All approaches are based on a free creative process. In a wider sense, however, two different approaches are found that can contribute towards generating a business model. The first approach uses **questions** and thus supports the generation of a business model using a questionnaire or a simple categorical system, such as the business model canvas by Osterwalder and Pigneur (2010). This approach works as a guide and should help to structure the answers, to enable the widest possible view of the business model. The second approach

attempts to structure the modeling process by a **graphical structure** thus providing a concept to create the business model by using a previously defined structure.

The most often used modeling process is characterized by simple questions and the discussion of the content of the business model dimensions. This means that the modeling of business models must be carried out without previously defined methods or structures. The only help comes from the questionnaire, which should support the modeling of the business model. The second modeling process is based on a graphical presentation form. These approaches are offered by Gordijn et al. (2001) and Osterwalder (2004). A closer examination of these notations will be carried out in the next section of the analysis.

9.3.4 Representation

A possible expression of this criterion is the **data model**. A detailed elaboration of the different elements of a business model enables the development of tools for generation and analysis of business models. A variant is a **graphical notation** form. This form supports the modeling of business models using predefined objects and structures.

In the considered publications, only three authors treated the question of an appropriate representation of business models. Osterwalder (2004) proposes a comprehensive data model with BM2L. With the e3-value approach™, Gordijn et al. (2001) pursue a graphical representation of business models. Using this approach, an improved communication for decision making in developing the business model, and a more complete understanding of the operations and requirements is made possible. In contrast to Gordijn et al. (2001), Slywotzky et al. (2002) use a simple graphical structure only to analyze the business logic of selected companies.

9.4 Summary and Perspectives

With the growing role of services, the contribution of services to business models and the transformation of business models become a key challenge for many companies. The wide range of current applications of the business model construct demonstrates that the business model construct is generally well-suited to support the analysis and design of the business logic of services in many contexts. One could even argue that a business model lens is particular helpful for companies in the transition from products to services. Taking the perspective of a business model helps companies to focus on value creation and value capture irrespective whether this involves products or services. Consequently, the thinking in business models

prevents companies, which offer products and services, from a premature commitment to a specific form of implementation. Essential for this is the focus on the underlying value proposition, which first abstracts from the concrete implementation. In addition, by the systematic analysis and the identification of alternative ways, the view will be guided to the revenue models. These alternative revenue models require almost an inevitably move away from pure product transactions, e.g. when moving to value- or usage-dependent pricing models.

Nevertheless, existing business model approaches have a lack in the focus on service-specific aspects. An *objective* currently missing, however, is research that explicitly addresses a changing role of services in business models through the lens of business model research. For example, there is growing interest in **servitization** of manufacturing. Servitization refers to the transition from products to services in manufacturing (Neely 2008). Like value chain reconfiguration, servitization creates opportunities for new business models in traditional manufacturing enterprises, e.g. through pricing based on the utilization or performance of products (Burianek, Bonnemeier and Reichwald 2008).

Other gaps can be found in the *structure* of a business mode. A key characteristic of services is **co-creation**. Co-creation indicates that value creation is often a joint activity of a customer and a provider of services (Vargo and Lusch 2004). A customer may, for example, provide technology and human resources for the implementation of the business model. Consequently, a customer may also be a business actor or partner for realizing the business model.

Related to co-creation is the **front-back logic** for organizing service delivery (Zomerdiek and deVries 2007). The front-back logic acknowledges a trade-off between service experience and efficiency. Every part of service delivery that involves customers influences how customers experience a service. In order to improve experience and customization of service delivery, the front-back logic advocate a separation of customer-facing activities (front-end) from customer- independent activties of service delivery (back-end). Front-end activties are then designed for service experience, while back-end activities are designed for efficient delivery.

In the consideration of the authors, the co-creation played a minor role. Mentioned by Osterwalder (2004) as well as Amit et al. (2004), the PC configurator of DELL is one example for the influence of the customer on the value creation. Ballon (2007) adds to this by stating that sometimes it is necessary to allow the customer an involvement in the construction of the value proposition. Bask et al. (2010) extends this through the possible involvement of the cus-

tomer in development and evaluation of the services. Other elements of the co-creation are not mentioned. Likewise, none of the extant models explicitly provide support for the front-back logic.

Both approaches at the *modeling process*, questions and graphical structuring, do not provide specific links to product or service development. Therefore, the integration of business modeling with **new service development** (Froehle, Roth and Voss 2000) or service engineering (Bullinger, Fähnrich and Meiren 2003) remains wanting. In part, the generation of a business model raises the same or similar issues as the development of a new service does. Likewise, new service development may benefit from analyzing and generating business models.

In extension of the co-creation aspect, the *representation* of business models could support **actor association**, i.e. the link of customers and other actors to the elements of a business model. Such an association represents and visualizes the contribution of actors to a business model. In particular, this association helps to understand the co-creation aspect involved in a business model. So far, none of the approaches support actor association.

In sum, the current approaches to business modeling do not provide explicit support for service-related aspects that are key for understanding and designing a service-based business logic. More research on servitization with a business model lens could generate a richer view of types of service business models, particular in manufacturing and other technology industries. Moreover, adding elements and relationships to capture and represent co-creation and the front-back logic would provide better support for focusing on critical issues for service design and delivery. Finally, a better integration of business modeling with new service development and service engineering could improve the use of the business model constructs in these processes.

Overall, these calls for a broader application of the business model construct in service research and, simultaneously, for an extension of this construct to better reflect the pressing issues of service engineering and management. This makes this a fruitful field for service research.

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10 Introducing a Co-Creation Perspective to Service Business Models

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.

Abstract

Due to the growing importance of services for many companies and the resulting transformation of product based business models to service based business models, the paper focuses on the link between business models and services. For this purpose the business model canvas of Osterwalder is adapted to address the shortcoming relating to co-creation of extant business models.

Keywords

Service, business models, business model canvas

10.1 Introduction

Services are a key driver of growth and profitability for many companies (Chesbrough & Spohrer 2006). Particularly firms in technology industries, such as IT, aerospace, medical technology, and automotive capture an increasing share of their income and profits with services (Neely 2009). Thus, for these enterprises, services have become an essential part of their business models, leading more and more of these companies to transform their product based business models to service based business models. According to this transformation approaches for modeling are necessary. As a recent study shows, extant business model approaches have a lack in focusing specific aspects regarding to services (Zolnowski & Böhmann 2011). This paper therefore proposes the use of an adaptation of Osterwalder´s business model canvas to support the modeling of service business models.

The remainder of the paper is structured as follows. Conceptual foundations about the understanding of business models in general and the business model canvas of Osterwalder as well as a general understanding of co-creation are given in chapter two. Based on this theoretical background in chapter three we derive the problem of considering service specific aspects in recent business model approaches. Moreover, we adapt the business model canvas of Osterwalder to match the requirements of service based business models. Finally we sum up the findings and give an outlook.

10.2 Conceptual foundations

10.2.1 Business models

The academic literature offers a variety of possible conceptualizations of the business model construct. Recently, however, the different approaches seem to converge. Al-Debai (Al-Debei 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-Debei 2010). Similarly Osterwalder (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 also developed the business model canvas, which represents a visualization of the business model dimensions (Osterwalder & Pigneur 2010). We decided to use this approach by Osterwalder, because of the systematic and easy use of the structure as well as the handy visualization. Figure 10 shows the Osterwalder business model canvas, which is based on nine different dimensions.

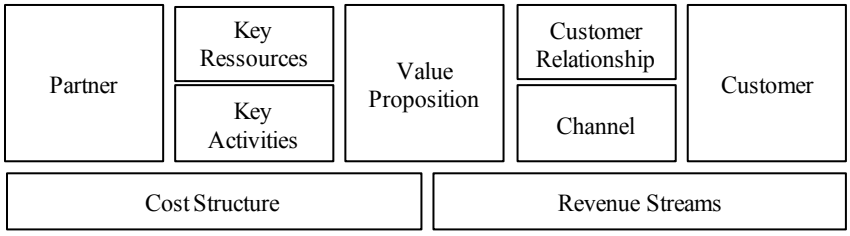

Figure 10: Business Model Canvas
Source: (Osterwalder & Pigneur 2010)

10.2.2 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 value-creation (Spohrer et al. 2008; Edvardsson et al. 2010). From this point of view the customers can tailor the product or service pursuant to their needs, which results in an enhanced value created (Kristensson et al. 2008). This also implies that customers can be part of the value creation along the complete value creating activities e.g. maybe from the development to the delivery of a product or service by providing customer-specific knowledge (Gustafsson et al. 2011).

After a brief introduction into the basics of the business model and the co-creation, the main problem of the existing business model construct will be outlined and a possible solution will be introduced.

10.3 Service Business Models

10.3.1 Problem

The business model construct will be used in order to analyse, describe and evolve the business model of products as well as services (Zolnowski & Böhmann 2010). Nevertheless, the consideration of business models has a lack of service-specific aspects. One important gap can be found in the structure of a business model. Co-creation, as a key characteristic of services, is not considered in most business model approaches (Zolnowski & Böhmann 2011). If it is considered, like in the Osterwalder Business model canvas, then only with little impact on the whole business model. For example Osterwalder limits co-creation to the customer relationship dimension (Osterwalder & Pigneur 2010).

This aspect is emphasized by the graphical illustration of the business model (figure 1). The business model canvas and the arrangement of the nine dimensions follow a goods-dominant logic view, where the dimensions are organized along a value chain. This chain starts with partners and key resources as well as key activities leading to the value proposition and at the end to the handling of the customer. This structure suggests that neither customers can participate in the value creation nor partners are involved in customer-specific aspects of the business model.

10.3.2 Proposal for a solution

A possible way to address the described problem is to change the perspective on business models from a product to a service based point of view. To achieve this it is necessary that the framework permits a structure where the customer can be part of all aspects of the business model. A possible way for this is to change the composition of the nine blocks in Osterwalder´s business model canvas. The new structure is given in Figure 11.

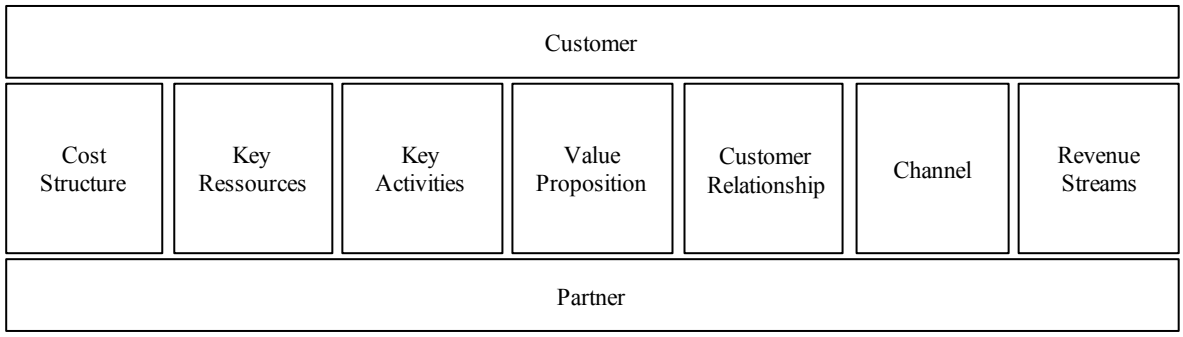

Figure 11: Adapted Business Model Canvas
Source: Business Model Canvas based on (Osterwalder & Pigneur 2010)

As Figure 11 shows by encompassing the rest of the blocks with customers as well as partners the deep integration into the value co-creation is represented. With this adaptation it is possible to reflect business models where a customer may have influence on each dimension of the business model. In the following examples are given, which represent potential resources of co-creation.

In many cases of service provision there is a need for customer integration. This is due to the fact that most services need to be provided individually for the customer. This leads to a dynamic role of the customer in the service provision where the provider´s mission is to help the customer to create value according to the specifications (Grönroos & Ravald 2011). The value creation is focusing on shared monetary benefits and revenue, for example, sharing of financial gain and gaining joint contracts. Moreover, the relationship with the customer can be designed based on the desired customer experience. Analogous to this the channel has to be chosen. Further, customers have to be integrated into communication, sales and distribution as well as into open innovation processes, for example, through social media. On the one hand, customers can provide resources like infrastructure or technology and on the other hand they can influence the selection and use of resources. The service provision is directly influenced by the customers and delivered by joint activities. Depending on the objectives of the service provision costs are borne by customers. Table 12 sums up the outlined impacts of co-creation in service business models.

Element	Customer perspective – Evidence of co-creation in business model elements
Cost Structure	• Cost incurred / borne by customers
Key Resources	• Customer providing resources • Customers influence on resource selection and use (e.g. selecting a specific consultant or varying volume of demand)
Key Activities	• Joint activities • Customers influence on activities
Value Proposition	• Specification of how service provider helps customers to create value
Customer Relationship	• Desired customer experience
Channel	• Derived customer experience • Open innovation • Integration of customers in communication, sales and distribution (e.g. through social media)
Revenue Streams	• Shared monetary benefits / revenue (e.g. sharing of financial gain and gaining joint contracts)

Table 12: Customer perspective –Evidence of co-creation in business model elements

In addition to the customer, partners can also affect the service business model and influence all dimensions. On the one hand, the provider can request help from partners, on the other hand the provider can offer a platform for his partners to distribute own services and products. In this case the service provider holds an infrastructure that can be used by partners to access customers. An example of this kind of business model is Apple Inc., which is selling devices with access to an app store where partners are able to offer products to their customers. Therefore the main differences between partners and customers can be found in the elements Value Proposition, Customer Relationship and Channel, where partner support the provision of the service. The influence of the partners of the business model is shown in Table 13.

Element	Partner perspective –Evidence of co-creation in business model elements
Cost Structure	• Cost incurred / borne by partners
Key Resources	• Partner providing resources • Mutual influence on resource selection and use
Key Activities	• Joint activities
Value Proposition	• Partner enhances co-creation of provider and vice versa
Customer Relationship	• Provider opens customer relationship to partners and vice versa
Channel	• Partner opens channels to customers for partners and vice versa
Revenue Streams	• Shared monetary benefits / revenue

Table 13: Partner perspective –Evidence of co-creation in business model elements

10.4 Conclusion and Outlook

The paper shows how an adaptation of Osterwalder´s business model canvas can be utilized to take co-creation into account of business modeling, which is a main shortcoming of recent business model approaches. Hence, the adapted model gives a framework that is eligible to model service businesses, because one of the main characteristics of them is supported considering customers as well as partners. This allows representing a deep integration of the customers and partners in the value creation. According to the understanding of business implied by service dominant logic this is a critical aspect and is not applied in recent business model approaches. Furthermore with the adapted model it is possible to analyze, describe and evolve business models with emphasis on services.

As this paper represents research-in-progress the described solution cannot be seen as a complete solution for all paucities of recent business model approaches, but it gives an implication how to deal with service specifics in the context of business modeling. The next step on the research agenda addresses a refinement of the business model canvas according to service-dominant logic. Further, a meta model for the service business model will be abstracted. Beyond this it will be necessary to prove the adaptation by specific examples in order to evaluate the adapted business model canvas.

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11 Customer integration in service business models

Zolnowski, A., Böhmann, T. (2013): Customer integration in service business models. Proceedings of 46th Hawaii International Conference on System Sciences (HICSS-46).

Abstract

Business models are a widely used concept to analyze existing and design new offerings. Applied in service environments, however, existing business model approaches are reaching their limits. Service specific aspects, like co-creation, are not taken into account. Based on the Business Model Ontology by Osterwalder, this paper discusses the impact of co-creation on business models and suggests requirements for the representation of service. For the development of these requirements, we take service-dominant logic as a theoretical vantage point. In particular, we use the reasoning of service-dominant logic on value and value co-creation to develop a representation for the extensive integration of the customer into the value creation process.

11.1 Introduction

With more and more enterprises relying on service as a critical source of revenue and profitability, service business models have become a focus of research and an area of industry application (Osterwalder 2004; Chesbrough & Spohrer 2006; Osterwalder & Pigneur 2010). This is mirrored by a shift of thinking about value creation towards a service-dominant view.

The service-dominant logic (SDL) emphasizes a shift from a goods-centered to a service-centered economy. This shift comprises i.e. a shift from product to service/process, production to utilization, transaction to relationship and supply chain to value networks (Vargo & Lusch 2008; Lusch et al. 2009). Further, SDL focuses on value and value creation (Vargo & Lusch 2004).

Information and Communications Technology (ICT) is a key driver for the emergence of service business models. ICT provide a powerful platform for fostering the integration of customers and providers as active participants in value creation (Tuunanen et al. 2010), thus enabling novel business models that leverage value co-creation.

Given such a fundamental shift in thinking about value creation, research is called to examine critically the ways we reason about novel routes to value creation, such as business models. Business models evolved as a concept in practice as well as research during the rise of the Internet in the mid 1990s (Ethiraj et al. 2000; Wirtz 2001; Afuah & Tucci 2007; Zott et al. 2010). The concept of business models has been transformed into representations that support the analysis and development of a specific logic for value creation and value capture.

Research on business model representation can be divided in two main streams. One stream offers a flow logic that considers value flows and activities. A prominent example for this is the e3-Value method. The second stream offers a system-level holistic view on the business logic of an economic entity or offering (Zott et al. 2010). The most widely cited method in this stream is the business model ontology or the business model canvas (Osterwalder & Pigneur 2010) Given the widespread reception in research and broad adoption in practice, this paper focuses on the holistic research stream in general and the business model ontology in particular.

Nevertheless, extant holistic business model approaches lack service specific aspects (Zolnowski & Böhmann 2010). A review of holistic business model ontologies and business

model representation forms shows that the representation of important service characteristics, like the co-creation of value, is not implemented properly (Zolnowski et al. 2011, 2012).

This paper contributes to service research as well as business model research by analyzing the impact of co-creation, as one of the key concepts in SDL, on business models. Based on this discussion, we propose requirements to extensions to the business model ontology of Osterwalder and Pigneur (Osterwalder 2004; Osterwalder & Pigneur 2010) that reflect current key aspects of the reasoning on SDL. Hence, the discussed research questions are: "What impact has co-creation on a holistic business model like the Business Model Ontology? What is required to support better the analysis and development of service business models?".

This paper begins with a brief introduction of business models and the co-creation concept. After elaborating the theoretical foundations, the impact of co-creation on the dimensions of the business model is analyzed and discussed and the results are illustrated with an example of an ICT enabled remote service from the manufacturing industry. Finally, the paper ends with a brief summary of the results and implications for further research.

11.2 Theoretical foundation

11.2.1 Business models

Business models can be used to analyze, design and compare different value creation and value capturing approaches. They are very popular (Osterwalder et al. 2005) and offer a manifold applicability. Nevertheless, a variety of literature reviews show, that there is still no unanimity about the definition in the business model research community (Osterwalder 2004; Al-Debei 2010; Zolnowski & Böhmann 2010). Different definitions and conceptualizations of the business model concept can be found i.e. at (Slywotzky & Morrison 1998; Timmers 1998; Ethiraj et al. 2000; Wirtz 2001; Afuah & Tucci 2007; Zott & Amit 2007; Al-Debei 2010). Beside the different definitions, different ontologies exist for representing business models. The most common ones are the e3-value Ontology (e3-value) (Gordijn 2002), the Business Model Ontology (BMO) (Osterwalder 2004) and the Resource-Event-Agent Ontology (McCarthy 1982).

In general, the business model research can be divided into two main research streams. The first research stream comprises a flow view of the business model and thus the process of value exchange in a business will be covered. This stream is represented i.e. by (McCarthy 1982;

Slywotzky & Morrison 1998; Gordijn 2002). The second stream focuses on constitutive characteristics of business models. The authors force the search for essential components of the business model and therewith a holistic overview on the business logic, like in (Timmers 1998; Osterwalder 2004; Al-Debei 2010).

As existing literature shows, co-creation can be represented with concepts and methods of the flow research stream, e.g. using e3 value and proposed service-specific extensions (Razo-Zapata et al. 2011). By contrast, holistic approaches currently have limitation with regard to co-creation and no service-related adaptations have been proposed so far (Zolnowski et al. 2012). Given the widespread use of the holistic approaches, particularly the BMO, in research and practice, such a critical review and extension is still an open research issue (Fielt 2012).

For the purpose of this contribution, the authors follow a holistic view on the business model. According to this perspective, a business model is a abstract representation that depicts a set of elements and their relationships in order to explain how a company creates and captures value (Chesbrough & Rosenbloom 2002; Osterwalder 2004; Al-Debei 2010). One popular representative of the holistic perspective is the Business Model Ontology (Osterwalder 2004), which is derived of a literature overview and which represents a formalization of the elements, relationships, vocabulary and semantics of a business model. Based on this, the Business Model Canvas was developed. The Business Model Canvas (Osterwalder & Pigneur 2010) is a visualization of the key elements of a business model and their relationships. The Model was especially evolved for use in practice.

The Business Model Canvas (BMC) was developed in association with a large number of practitioners and is a slight development of the origin BMO. Both consist of nine dimensions that are clustered into four so called pillars. A further investigation of the nine dimensions and their relations is given in section 3.1.

In sum, the business model concept offers a system-level holistic view on the business logic. This view focuses on activities that are needed for a successful execution of the business and the value that is offered to the customer, by explaining value creation and value capturing (Zott et al. 2010). Hence, the value, and in a narrow view the value proposition, is the central element of a business model (Osterwalder 2004; Al-Debei 2010; Zolnowski & Böhmann 2010). Nevertheless, despite of the holistic view and a focus on value, when using the busi-

ness model concept, it is necessary to define the level of abstraction. This is, because a business model can illustrate the business logic of a whole firm as well as of a specific offering.

This paper is following the business model definition of the BMO and with the BMC its further development. The main reason for its use is its basis of a literature review and the analysis of the main business model literature of its time. Furthermore, the BMC is widely used in practice and was already used for analysis and development of different products and services. At last, this approach follows the authors view on the purpose of business models.

After the brief introduction into the business model research, SDL and especially the co-creation will be considered.

11.2.2 SDL and the integration of the customer

"Evolving to a New Dominant Logic for Marketing" was published in 2004 by (Vargo & Lusch 2004) and presents a new perspective on the exchange in economics, which is called the service-dominant logic. The focus on service was necessary because of the rising importance of the exchange of intangibles, skills, and knowledge as well as processes instead of tangible goods (Vargo & Lusch 2004). Therewith, Vargo and Lusch created an unifying framework for a more comprehensive view on marketing (Vargo & Morgan 2005; Vargo & Lusch 2006).

The main focus of the service-dominant level is value and value creation and thus value for the stakeholder as well as the way the value is created. Service is the main basis for value exchange and will be created in cooperation of different actors (Vargo & Lusch 2004; Vargo & Lusch 2011).

In contrast to the classic goods-dominant logic, service is not defined by the IHIP criteria. Even more, Vargo and Morgan describe these criteria as four service antitheses (Vargo & Lusch 2004). In conclusion, service is defined as "the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself" (Vargo & Lusch 2004).

In order to characterize this new dominant logic, Vargo and Lusch (Vargo & Lusch 2004) propose foundational premises. The most recent publications of Vargo (Vargo 2012) as well as Lusch (Lusch 2012) show a hierarchy between these foundational premises and hence em-

phasize four so called core premises (CP). These are summarized in table 1 (Lusch 2012; Vargo 2012).

Core premise (CP)	Description
1	Service is the basis of any exchange
2	Value is always co-created with the customer
3	All actors are resource integrators
4	Value is uniquely and phenomenologically determine by the beneficiary

Table 14: The core premises of SDL
Source: (Lusch 2012); (Vargo 2012)

The first core premise underlines the importance of service in economics and claims that service is exchanged for service. Even more, service is treated as a singular term. The change from the term "services" away to "service" underlines the process oriented characteristic as well as the definition of service, which emphasizes the use of one's resources for the benefit of another actor. The next core premise highlights a broad involvement of the customer in the value creation process (Prahalad & Ramaswamy 2004; Vargo & Lusch 2004) and thus the understanding of the customer as part of the entire service (Spohrer et al. 2008; Edvardsson et al. 2010), which results in an enhanced value for all actors (Kristensson et al. 2008). An important message of this premise is that resources and activities of a service do not create value by themselves. Rather, the value is created by co-creation between the provider and the customer. Simultaneous, co-creation illustrates an important change in the logic of value provision. It describes a shift from value-in-exchange (transactional) to value-in-use (relational) or value-in-context (Vargo & Lusch 2004; Edvardsson et al. 2010; Chandler & Vargo 2011). Co-creation can be seen in strong relationship to the next premise. In the third core premise, Vargo and Lusch (Vargo & Lusch 2008) argue that all actors, e.g. firms and customers, are resource integrators. Resources, like knowledge and skills, have to be integrated in the service process by any actors. The integration of these resources facilitates the co-creation of value and helps to fulfill the needs and demands of the customer. The last core premise defines the nature of value. The description of value as uniquely and phenomenological (Vargo & Lusch 2008) means that value is idiosyncratic, experiential, contextual and meaning laden (Vargo & Akaka 2009). Thus, value is subjective and has a unique character that is shaped by the individual context of every actor.

Summarized, SDL highlights the importance of co-creation and customer integration in many different ways. This is necessary, because the nature of value is uniquely and phenomenologically determined by the beneficiary (CP4) (Vargo & Lusch 2004, 2008). Furthermore, analo-

gous to core premise 3, the integration of resources as well as operation on available resources is necessary to receive the desired value from a service (Vargo & Lusch 2006; Vargo & Lusch 2008).

Both premises highlight the importance of the customer in the service provision process. This is reflected by the manifold influence of the customer on a service. As Gummesson (Gummesson 1998) states, a provider needs the participation of the customer to create value. A good example for this is the value-in-use concept of SDL. It describes the importance of the customer in the value creation process and the need of its skills and knowledge (Vargo & Lusch 2004). The integration of the customer's resources can have different goals. A provider integrates resources to serve the customer better or to co-create greater value. Analogous to this, a customer integrates resources to enable the provider to serve him better or to create greater value co-creation (Kohli 2006).

Value-in-use is only one example for co-creation. SDL emphasizes the integration of human resources, like skills and knowledge (operant resources) (Vargo & Lusch 2004, 2008) and operand resources (like e.g. physical resources) in the value creation. Furthermore, beside of the provision of these resources, customers have influence on decision-making concerning service provision activities (Moeller 2008; Payne et al. 2008).

But co-creation is more than this simple and ongoing resource integration and decision-making in a service process. During the whole lifecycle of a service, different possibilities for customer integration occur. This issue will be displayed by the three stages of the FTU Framework of Moeller (Moeller 2008). The stages, Facilities, Transformation and Usage, divide the service lifecycle in three different segments. Analogous to these three stages, Grönroos and Ravald (Grönroos & Ravald 2009) differentiate between Value Facilitation, Value Co-Creation and Sole Value Creation. The three stages of the FTU framework are depicted in table 2.

In sum, SDL introduces with the core premises aspects that characterize the nature of service. Thus, it is possible to consider service more focused and in more theoretically grounded way. According to this, service-oriented business models should be able to illustrate these core premises.

Stage	Description
Facilities	• Free of customer's influence • Providing resources and offering • Anticipating customer's value and interfaces to the customer
Transformation	• Transformation induced by firm or customer • Resource integration by firm and customer for joint value co-creation activities • Joint decisions
Usage	• Customer as prime resource integrators during usage • Value creation in use

Table 15: Description of the FTU Framework
Source: (Moeller 2008)

11.2.3 Research methodology

For a better illustration of the results of this research, a case from a remote service in the manufacturing industry was selected. The data collection was conducted during 13 expert interviews in the context of a research project on business opportunities with e-services, each lasting 60-120 minutes. Our interviewees comprise 5 industry experts and 8 company experts with broad knowledge of the application of remote services or in-depth knowledge of the use of remote services in a particular manufacturing company. All interviews were divided into two parts. The first part contained closed questions regarding basic information on the company. The second part consisted of open questions that focus on the status quo and future of e-services and remote services..

During the analysis of the data, all interviews were summarized and the results clustered. By doing this, five examples were identified that provided deep insight into remote service offerings in different industries. For this research one of these examples was selected and employed.

The considered manufacturing company offers systems for continuous production processes and employed more than 10.000 employees in 2009. In this time period this company had a turnover more than 1 bn. Euros. The remote service technology is used to automated collection and analysis of customer data, therewith to enhance customer knowledge and to develop (new) products and services tailored exactly at the customer's needs. Furthermore, remote services improve maintenance services and decrease time requirements on the provider side and maintenance costs on the customer side.

To reduce the complexity of this case, we are focusing on the ICT enabled maintenance service of the company. This service comprises an automated monitoring of the customer's ma-

chines and processes and predefined response times in case of an emergency. The anonymized name of the company is “RemServ”. In the following, the impact of the customer on the service business model is investigated.

11.3 Representing customer impact in service business models

11.3.1 Foundational business model ontology

As already mentioned, the authors understand a business model as a system-level holistic view on the business logic with a focus on value and its creation. Because of the corresponding understanding of Osterwalder (Osterwalder 2004), the authors chose this ontology for further investigation. Due to the development of the BMO to the BMC, and the high popularity of the BMC, the authors decided to employ the newer version. In the following, based on (Osterwalder 2004; Osterwalder & Pigneur 2010) an overview of the nine dimensions is given.

The customer segment illustrates the target customer with its characteristics. By defining characteristics, it is possible to define customer needs in a more detailed way. The value proposition represents the potential value that the customer can receive by the offering. Therefore, the provider has to consider the customer and its problems, needs and wants. Key resources are the main resources needed for the development and provision of a service. Possible resources contain physical, intellectual, human and financial resources. Equivalent to the resources, the key activities dimension covers the main value-creating activities for the development and provision of a service. Activities contain i.e. production, problem-solving and network activities. The customer relationship defines the relationship between the provider and its customer. It is dealing with the way of how to establish and maintain the relationship to the customer and how to integrate it in the business model. The channel illustrates the way of how the provider gets in touch with its customer and focuses on the interaction and delivery of the potential value. The revenue stream comprises the logic of how to gain profit with the business model. This comprises the revenue as well as the pricing model for each customer segment and thereby attempts to find an equitable balance for the exchange. Thus, this dimension explains how a value has to be priced. The key partnership illustrates the need for a partnership in the development and provision of a service. Osterwalder and Pigneur (Osterwalder & Pigneur 2010) differentiate between four types of partnerships (strategic allianc-

es, cooptation, joint-ventures and buyer-supplier relationships). Thus, partners get implemented to the business model to enable or improve activities by integrating resources.

After a detailed investigation of the dimensions, now the relationships are considered. Nevertheless, the BMC does not provide information about the relationships between the proposed elements. For this reason, the authors mix up the BMC with the underlying information from the BMO. The results of this task are illustrated in figure 1 and show the missing impact of the customer on the other business model elements. Equivalent to this, former contributions identify the same issue. A comparison between different business model ontologies shows that there is no ontology, which follows a holistic view that displays service in a comprehensive way (Zolnowski et al. 2012). Furthermore, a comparison between diverse business model canvas illustrations shows first approaches to solve this research gap, but no overall convincing solution (Zolnowski et al. 2011).

However, in the existing BMO, the customer is just a consumer that receives a value proposition over a distribution channel and is maintained over the customer relationship. No further relationship between the customer and the other business model dimensions exists.

Only for the business model development the BMC offers the possibility to choose a customer-driven perspective. This is a starting point that requires a customer needs based adaption of all other dimensions. Nevertheless, this change does not help to understand co-creation of value, because value is created during interactions of resources and activities between customer and provider.

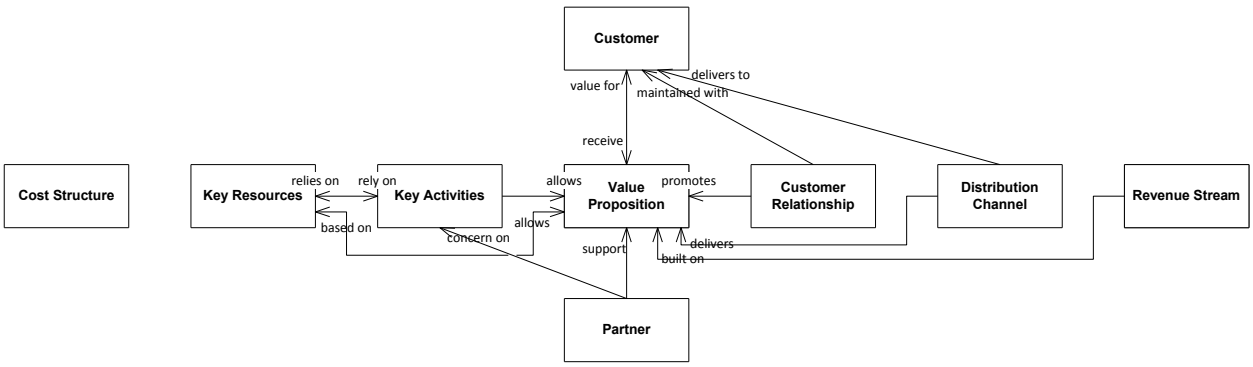

Figure 12: Elements and internal relationships of the BMO
Source: (Osterwalder 2004); (Osterwalder & Pigneur 2010)

After the brief introduction of the object, the customer's impact is described. Therefore, we start with the two most important dimensions customer and value proposition. After that, we continue with the remaining dimensions from left to right (see figure 1).

Based on our data from the expert interviews, the influence of the customer on the business model dimensions will be illustrated in the following. Therefore, each dimension will be considered separately and the influence during the three stages (FTU) analyzed. Thereafter, on basis of our selected case, table 3 gives examples for customer integration.

11.3.2 Influence of the customer

Customer

Firstly, the customer dimension is considered. As already stated, this dimension is one of the main elements in SDL and comprises the target customer segment. Providers depend on their customers, because value is being co-created (Gummesson 1998).

As introduced by Vargo and Lusch (Vargo & Lusch 2006), SDL is a customer oriented and market driven perspective on the economy, in which value is created to satisfy needs and desires of a customer or a whole customer network. To fulfill this target, the provider has to learn from and collaborate with the customer. The collaboration comprises co-creation, respectively customer integration, with all its resource integration and decision-making. This is necessary for the realization of the value proposition and thus to deliver the customer the desired value. Furthermore, co-creation is important to create value-in-use during the consumption of the service. Value-in-use is created in real-time and aims to serve the customer in a better way, satisfy his needs or to improve its performance. Vargo and Lusch define a service as a process of resource application for the benefit of another entity (Vargo & Lusch 2004; Vargo & Lusch 2006; Vargo & Lusch 2008). Hence, value is created through co-creation (CP2) and integration of resources from providers and customers (CP3) (Vargo & Lusch 2008).

Following Moeller (Moeller 2008), during the *Facilities* stage the customer has mostly no influence on the service and thus the business model. Within this stage, the company defines the target customer and must investigate the customer's context and processes (see also table 3). Nevertheless, in some cases it might be possible that provider and customer design a new

service in collaboration. In this case, the customer has already an influence like in the transformation stage.

In the customer-induced *Transformation* stage, the customer has to articulate his specific needs and wishes, to illustrate his possible integration and to cooperate in decision-making. Nevertheless, the provider has the coordination role in the service provision (Moeller 2008).

During the *Usage* stage, the customer is defined as main resource integrator and decision-maker. At that stage the customer benefits from the activities during the Transformation process.

Value Proposition

Second, we consider the value proposition. It is the central element of any business model approach and an important part of the SDL.

In contrast to the transaction logic of GDL, in SDL value creation is a process which aims at serving customer, satisfy its needs and improve the performance (Vargo & Lusch 2008). Hence, a service is a process driven approach (CP1), which has to be co-created with the customer (CP2). During the co-creation, the customers as well as other actors have to integrate resources (CP3) and helps in decision-making (Vargo & Lusch 2004, 2008).

In the *Facilities* stage, a provider designs and offers a value proposition for the customer. In some cases it is also possible that an offering is designed in cooperation with a customer and thus the customer has to integrate his resources into the offering and to participate at the decision-making processes (Moeller 2008).

During a customer-induced *Transformation*, the value proposition can be already part of the value creation process and thus provides the desired value for the customer (Moeller 2008). In this stage, the prerequisites and targets for the actual service provision are defined (see also table 3). To achieve optimal value in the specific context of the customer, it is necessary to negotiate about the customer's resource integration and decision-making power. Context is thereby more than only the target, needs and wishes of the customer; rather, the social context is important for the determination of value (Böhmann et al. 2012).

The *Usage* stage describes the use of the value proposition and therewith the actual value that is gained by the customer. The customer decides on his own to use a service and to integrate resources or not.

Cost Structure

This dimension represents the main cost elements that are employed in a business model and thus answer the question which costs occur and are most expensive (Osterwalder & Pigneur 2010). Surprisingly, the cost structure has no relation to any other dimension in the BMO.

Correspondingly to the GDL, also SDL recommends to consider the financial situation. This is, because financial data can help to learn from and improve an offering and its performance with the aim to better satisfy the needs and desires of the customer (Vargo & Lusch 2006). Due to the SDL, the customer is co-creator and resource integrator in a service process. Hence, he has direct influence on the cost structure of the business model.

In the *Facilities* stage, there is mostly no relationship between provider and customer. Only in case, when an offering is designed in cooperation, the actors have to negotiate which costs occur and how to share them.

The *Transformation* stage offers more interactions between provider and customer. By integrating resources and decision-making, the customer has influence on the cost structure of a service. By integrating own resources, the price of the service provision can be reduced or occurring costs can be shared. Furthermore, the customer can demand more or less value proposition, which has also influence on the whole price (see example in table 3).

For the duration of the *Usage* stage, the customer has to take the consequences and either shares the costs with the provider or just pays for the occurring costs.

Key Resources and Key Activities

As proposed by Vargo and Lusch, SDL is based on the resource advantage theory (i.e. (Conner & Prahalad 1996)) and the core competency theory (i.e. (Prahalad & Hamel 1990)). Hence, resources are the main elements to gain competitive advantage. To emphasize the importance and human resources, like skills and knowledge, Vargo and Lusch introduce the concept of operant and operand resources (Vargo & Lusch 2004). Operant resources are the main element in co-creating value.

During the *Facilities* stage, there is mostly no relationship between these two dimensions and the customer. But, if necessary, the provider has to design possible interfaces to the activities and resources of the customer. In case of a cooperative design of an offer, resources and activities have to be shared.

The *Transformation* stage comprises a negotiation phase between provider and customer, to define possible resource integration and decision-making power. Furthermore, the customer can co-determine resources that have to be used or activities that have to be done by the provider, to get the best possible result (see example in table 3).

In the *Usage* stage, the situation is analogous to the cost structure. All decisions made have to be taken with all its consequences.

Customer Relationship

Due to the relational character of SDL, the relationship has a very important role in a service business model. It underlines the interactivity and collaboration of the service provision and thus the co-creation of value (CP2) (Vargo & Lusch 2004). But more than the monetary profit for the provider, value will be created on both sides of the cooperation. Co-creation helps to build-up information and knowledge that can be used to develop and create additional value for the customer. Furthermore, the relationship is characterized by the brand of the firm or the service (Vargo & Lusch 2008).

During the *Facilities* stage, the provider has to define how to acquire and maintain the customer and what possible interfaces are. The customer himself has no influence in this phase.

In contrast, the *Transformation* stage allows a number of possible interactions. In this dimension, the customer has to decide from the offered alternatives, if there are some, how he would like to be treated and what intensity of co-creation he needs (see table 3).

In the *Usage* stage, the relationship for the co-creation is already defined. So the customer has to be maintained over the previously co-determined relationship.

Distribution Channel

A distribution channel is used for the distribution of applied skills, processes and knowledge; in other words, the channel is the dimension where the co-creation happens and value-in-use occurs (CP2) (Vargo & Lusch 2008).

In the *Facilities* stage, the provider has to define the channels he wants to use and offer in his business model. The customer has no influence in this phase.

During the *Transformation* stage, the customer has to decide from the offered alternatives, which channel he prefers. Thus, the partners have to decide, about the channel the co-creation occurs and the value is created (see example in table 3).

Like in the customer relationship dimension, the channel is in the *Usage* stage already defined. Thus, the co-creation can happen in the channel. Only if there are alternative channels, the customer has to decide which channel he wants to use. Furthermore, the customer has to integrate his resources for the solution of his issue if needed.

Revenue Stream

In the classic GDL, this dimension is very important for the business logic. This is, because of the dominance of the value-in-exchange concept.

In contrast, SDL focuses on value-in-use and thus on the relation between the provider and the customer. This means, that a long-term relationship is more important than a single transaction with the customer.

In the *Facilities* stage, the provider has to define the revenue as well as the pricing model. This is a prerequisite for the delivery of the service. The customer has no direct influence in this stage.

During the *Transformation* stage, the customer can decide between alternative pricing models (see table 3). Depending on the decision, the customer has to pay for the service. Furthermore, if revenues get generated in a service ecosystem on both sites, the actors could decide to share their revenues.

The *Usage* stage comprises the execution of the decisions. Thus there is no impact of the customer necessary.

Partner

SDL argue that a shift from a focus on supply and movement to partnerships, relationships, networks, value creation and value constellations is ongoing. Business models comprise not only two actors (provider and customer), in SDL business models are embedded in ecosystems on the provider as well as on the customer side (Lusch et al. 2009).

In the *Facilities* stage, the provider has to decide, if he needs partners for value creation or not. If a partner can enable or improve an activity, the provider could decide to implement this partner to the business model. If this prerequisite is not necessary, the provider does not need to integrate any partner. In this phase, the customer has no influence.

In the *Transformation* stage, there is only indirect influence of the customer on possible partners. By articulating specific wishes that are not realizable by the provider, the provider has do decide if he wants to integrate a partner into the value creation process or not (see example in table 3).

If the provider decides to integrate a partner, the customer gets in contact with him in the *Usage* stage. Thus, a physical connection exists, but no direct business connection. The connection is maintained by the provider and the value proposition (Lusch et al. 2009).

Dimension	Customer integration
Customer	• RemServ investigates the specific context and business processes of the customer • Customer articulates his needs and wishes
Value Proposition	• Specific offering by RemServ – based on needs and wishes of the customer – comprises • Maintenance of the machines and the support of customer processes • Service level agreement for aspects like reaction time, service quality, responsibility
Cost Structure	• Cost share by an employment of the customer's internal process experts • Additional costs through remote service technology integration in legacy machines
Key Resources and Key Activities	• Customer has to integrate remote service technology to his machines • Customer overtakes activities by employing own process experts
Customer Relationship	• Permanent collection and analysis of customer data • RemServ build up unique knowledge about the customer and offers unique value propositions
Distribution	• The customer choses 24/7 remote service over the internet

Channel	• In case of an emergency, the customer calls RemServ and orders technicians
Revenue Stream	• The customer decides during the negotiation phase its revenue model • He shares his costs savings with RemServ
Partner	• RemServ needs supplementary partners for the integration of legacy machines

Table 16: Influence of the customer in RemServ's business model

11.4 Requirements

This contribution discusses the value creation through service from the perspective of SDL on the business model ontology by Osterwalder and Pigneur. By proposing specific requirements for extensions related to co-creation, we enhance the ability of this widely used method to represent and support the analysis of service business models.

As shown in section 3.2., customers have manifold influence on a business model of a firm. In order to illustrate this, table 3 comprises the impact of the customer on the business model dimensions of our case study RemServ. Furthermore, as seen in figure 2, customer integration and co-creation has an overarching impact the BMO. This impact is visualized by red lines that show, according to our discussion, missing relationships between the customer and the other business model dimensions. Together with the discussion in section 3.2., we suggest to enhance the BMO by relationships that illustrate the impact of the customer of the other dimensions. As noticed, the influence of customer integration varies significantly between the three stages Facilities, Transformation and Usage. During the Facilities stage, the influence of the customer on the business model is relatively low. In line with (Moeller 2008; Grönroos & Ravald 2009), the authors observed that the most extensive influence can be found during the Transformation stage. In this stage, the customer can influence nearly every dimension of the business model, by integrating resources or decision-making. The co-creation in the Usage stage is characterized by the consequences of the decisions taken. So, mostly decisions are made and resources get integrated to use a service.

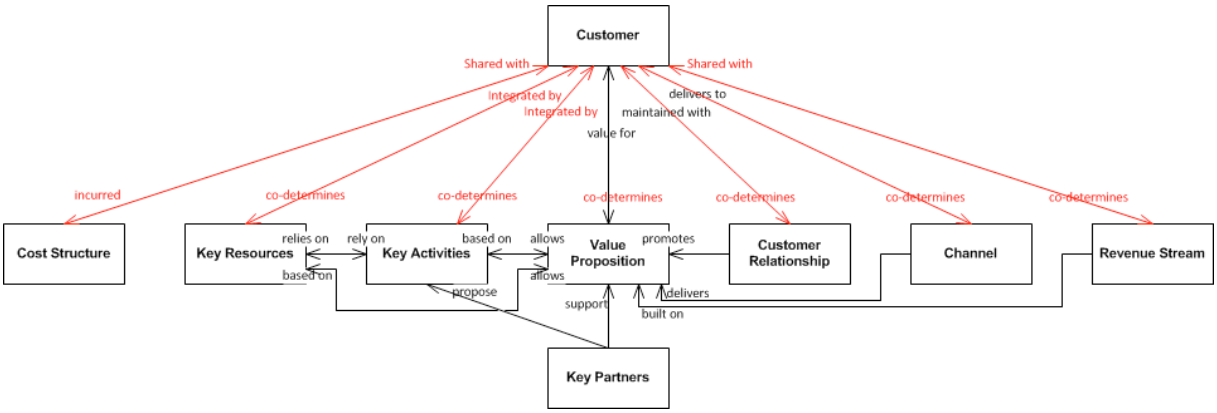

Figure 13: Integration of the customer in the transformation stages
Source: own representations

Hence, we suggest that existing business model approaches should be able to specify the influence of a customer and thus the relationship between a customer and the other business model dimensions. This is also the main limitation of existing holistic business model approaches, which have limitations to represent relationships between different dimensions of a business model. Thus we propose the first and overarching requirement:

R1. Service requires the representation of relationships between the customer dimension and the other dimension of a business model.

Based on our discussion and this fist requirement, we propose more detailed requirements for customer integration:

R2. A service business model needs to represent to what extend a customer co-determines the cost structure and revenue model. Moreover, a representation of revenue sharing and cost incurred by customers is required.

R3. A service business model needs to represent to what extend a customer co-determines the key resources and processes deployed by the provider to document the influence on resource selection and process adaptation. In addition, a service business model should represent how resources and processes are integrated into a customer's resources and processes.

R4. A service business models must show to what extend a customer co-determines the value proposition of the provider by integrating his specific situation, needs and wishes. Simultaneous, it has to illustrate the co-created value of the customer.

R5. A service business model has to represent to what extend a customer co-determines his relationship to the provider by influencing the way how he gets maintained and what channel the provider has to use.

11.5 Conclusion

The shift away from a transactional relationship (GDL) to a relational relationship (SDL) with the customer makes it also necessary to reconsider existing business model approaches. Co-creation and resource integration extend the interactions beyond a value-chain logic with the customer on the receiving end of this chain. Customers provide subjective needs and goals as well as a context that has to be managed. Thus a service has potentially to be adjusted to the customer and its specific context. This is represented by the high degree of interaction between the customer and the other business model dimensions. For this purpose we aim at the most prominent and widely cited approach Business Model Ontology.

A potential limitation of this paper is the strict focus on SDL, because there is still discussion on the foundational premises, as for example the consideration of value, as subjective element, in contrast to a separation between objective and subjective value. Furthermore, our findings are based on a single case study that gave us deep insight into remote services in manufacturing, but not into other industries.

By extending this concept according to our requirements, the BMO could increase its value for representing service business models. This could help managers to analyze and understand co-creation and thus the integration of the customer's resources into their own business logic. Furthermore, this paper contributes to the practice by showing direct links between the customer and the other business model dimensions. This enables managers, during the development of a new service business model, to think of how to leverage or accommodate the involvement of a specific customer.

Furthermore, this contribution helps scholars to analyze co-creation in practice in a more comprehensive way and thus to add to new knowledge to service research. In addition to this, this work contributes to the business model research in general, by illustrating and introducing co-creation on business models.

This contribution is one more step in the exploration of service and their business models. Right now, we have taken a widespread and popular business model approach to investigate

and extend it on their capability to illustrate service according to SDL. In further development, value and value networks, as other key aspects of SDL, has to be taken into account.

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12 Representing Service Business Models with the Service Business Model Canvas

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Abstract

IT is a major driver of business model innovation and servitization. Representations of business models are widely used tools for analyzing instances of these developments as well as for the ideation of novel services and service business models. However, current representations of business models fail to capture essential aspects of service, such as co-creation. In response to these shortcomings, the paper presents a representation for service business models. The utility and efficacy of this alternative business model representation is demonstrated with a case study of a proximity m-payment service in the German retail industry. We apply and compare the Business Model Canvas as well as the Service Business Model Canvas. Based on this application, we present an evaluation by an informed argument of the representation.

Keywords

Service, Business Models, Service Business Model Canvas, Case Study

12.1 Introduction

Increasing global competition, advances in technology, and the search for attractive market opportunities foster a process of servitization in many companies (Neu & Brown 2008). IT is a key driver of this process, enabling the generation of novel business models that leverage IT for co-creation of value (Zolnowski et al. 2011a). As a consequence the analysis and generation of service business models and the role of IT in these business models has become the focus of interest in practice and research (Chesbrough & Spohrer 2006; Osterwalder & Pigneur 2010; Zolnowski et al. 2011a). However, the exploitation of opportunities for innovating service business models faces a number of challenges. Service is characterized by its focus on value and value creation and requires a change from product to service, production to use, transaction to relationship and supply chain to value networks (Vargo & Lusch 2004, 2008; Lusch et al. 2010). Especially, information and communications technology (ICT), with its multi-sided nature, fosters the integration of customers and providers as active partners in value creation (Evans 2003). Hence, with its opportunities to actively integrate participants in value creation processes, ICT is a key driver for the emergence of service business models.

In order to exploit the opportunities of service, new service-based business models have to be developed. Representations of business models offer a possibility to support the analysis and development of a specific logic for value creation and value capture (Zolnowski & Böhmann 2011). Depending on the target of the development, different business model representations can be used. In general, research on business model representations can be divided into two research streams. The first stream offers a flow logic that considers value flows and activities. A prominent example for this is the e3-Value method (Gordijn 2002). The second stream offers a system-level holistic view on the business logic of an economic entity or offering (Zott et al. 2011). A prominent example for this stream is the Business Model Ontology (BMO) (Osterwalder 2004) and the Business Model Canvas (BMC) (Osterwalder & Pigneur 2010). In every stream, there is no dearth of methods for representing business models. However, there is a lack of cumulative research as most publications propose alternative representations rather than evolving existing models. As a consequence, this paper seeks to take a cumulative stance for the development of business model representations by proposing an addition to an existing method rather than a fully new, alternative representation. Calls for more cumulative research have been voiced in design science (Niederman & March 2012) as well as in business model research (Zott et al. 2011). This cumulative approach requires choosing a single representation as a base. We decided to add to the business model canvas (BMC) for two rea-

sons. It is to our knowledge the most widely cited representation in the academic literature as well as a broadly applied method in practice[4].

Previous research shows that the representation of service-specific aspects is missing in the business model canvas (Zolnowski & Böhmann 2011, 2013). In particular, the representation of customer integration and co-creation of value is missing (Zolnowski et al. 2011c, 2012). In order to overcome these issues, we propose an extension of the BMC that we call the Service Business Model Canvas (SBMC).

The research question of this paper is: “Can the service business model canvas improve the representation of service business models?" By answering this question, the paper also contributes to service research by proposing a demonstration of a service-specific business model approach (Chesbrough & Spohrer 2006). Service business models have shifted into the focus of service research recently, not the least in response to the call for research on service infusion and growth (Ostrom et al. 2010). A representation of service business models provides replicable methods for practitioners and researchers for representing the service business logic of individual cases. Moreover, representations contribute to the ongoing stream of research on methods to facilitate the design and engineering of service (e.g. (Patrício et al. 2008)). By using data of a complex real life service case to both concepts, BMC and SBMC, this research demonstrates the improvement of the SBMC in comparison to the BMC. The case underlines our evaluation by informed argument as it provides the complexity of a real service business model that is currently implemented.

This paper is organized as follows. After a brief introduction of business models, the research methodology and the EDEKA case study are introduced. On this basis, the resulting business model of EDEKA’s proximity m-payment service is introduced both as BMC and SBMC. Thereupon, the results get compared and the SBMC is evaluated by an informed argument to demonstrate its efficacy. Finally, this paper ends with a conclusion and an outlook.

[4] Academic reception: 869 citations on Google Scholar as of 2013-09-04 compared to 478 citations for e3-value. Proxy for adoption in practice: over 4m Google hits for "business model canvas" compared with less than 32,000 hits for "e3-value"

12.2 Conceptual foundations

12.2.1 Business Models

In recent years, business models have became a popular topic in research and practice (Zott et al. 2011). This popularity is based on their manifold applicability as a tool for the analysis and design of value creation and value capturing in companies (Chesbrough & Rosenbloom 2002; Osterwalder 2004). Nevertheless, this attention leads to a rising amount of publications in this field and a high diversity in the understanding of business models. As different literature reviews show, there is still no consensus in research about the definition of business models (Osterwalder 2004; Al-Debei 2010; Zolnowski & Böhmann 2011). Selected conceptualizations of the business model concept can be found at e.g. (Timmers 1998; Afuah & Tucci 2001; Zott & Amit 2007; Al-Debei 2010). In addition to the variety of conceptualizations and definitions, the diversity of the business model concept is also reflected by different ontologies. Three of the most common ontologies are the e3-value Ontology (Gordijn 2002), the BMO (Osterwalder 2004) and the Resource-Event-Agent Ontology (McCarthy 1982).

Considering existing business model research streams, the authors of this contribution follow a system-level holistic overview on the business logic that explains how to create and capture value (Zott et al. 2011). A widespread and popular approach in this field is the BMO (Osterwalder 2004). The BMO represents a formalization of the elements, relationships, vocabulary and semantics of a business model. Based on this ontology, Osterwalder and Pigneur (Osterwalder & Pigneur 2010) in conjunction with numerous practitioners developed the BMC. This approach represents a practice-oriented visualization of the key elements of a business model and their relationships.

12.2.2 Service Business Models

As already mentioned before, services become a crucial element for the business of many companies. Thus, a growing importance of service business models can be noted. In particular, service is defined by Vargo and Lusch (Vargo & Lusch 2008) in service-dominant logic, as "[…] the application of specialized competences (operant resources - knowledge and skills), through deeds, processes, and performances for the benefit of another entity or the entity itself". Hence, a service is a process that is applied for the benefit of another party.

Existing business model approaches already help analyzing and developing service in a different context (Zolnowski & Böhmann 2011). In particular, the business model lens helps to focus on value creation and value capturing and simultaneously not to loose a holistic picture.

However, the application of existing business model approaches, like the BMO, does not adequately consider all service-specific aspects (Zolnowski & Böhmann 2011). One important reason is that, in contrast to a classic goods perspective, a service is process oriented and relational (Vargo & Lusch 2004). Additionally, co-creation, as one of the foundational premises of service-dominant logic (Vargo & Lusch 2008), is missing in existing business model constructs (Zolnowski & Böhmann 2011; Zolnowski et al. 2012). Because value is always generated in co-creation with the customer and has a unique and phenomenological character, this aspect has an important impact on service business models (Vargo & Lusch 2008; Edvardsson et al. 2010).

Another aspect of a service is the resource integration of customers. Often, customers have to integrate resources into the value creation process to receive the desired value of a service. The integration of the customer can comprise e.g. skills, knowledge, physical resources as well as decisions (Moeller 2008; Grönroos & Ravald 2011).

Existing service oriented approaches like the CSOFT ontology (Heikkilä et al. 2008), the STOF model (Bouwman et al. 2005), and the VISOR framework (El Sawy et al. 2008) consider network-based value creation. This network-centric view is an important contribution to the representation of service business models that we also seek to incorporate into the SBMC. However, these approaches do not propose a representation for customer integration and value co-creation. Moreover, these research contributions propose alternative representations of business models rather than extending existing ones.

However, first solutions for the representation of co-creation were already developed and analyzed (Zolnowski et al. 2011c). Based on the solution of Zolnowski et al. (Zolnowski et al. 2011b), a further development was conducted. As depictured in Figure 1, the SBMC was separated into three different perspectives. These three perspectives are inspired by the swimlane representation of the Business Process Model and Notation (BPMN) (Object Management Group 2010). Hereby, a detailed analysis of any actor of a service is possible and thus service specific aspects are considered.

The overall solution is based on the conceptual foundations of the BMO and an extended elaboration of the relationships of the elements. Based on these improvements, the solution focuses on the representation of co-creation in business models. To achieve this goal, the SBMC analyses the business model through the perspective of all actors. In addition to the network-logic that emphasizes a network of actors, the SBMC emphasizes customers in addition to a focal actor and network partners. Figure 8 illustrates the content of the SBMC.

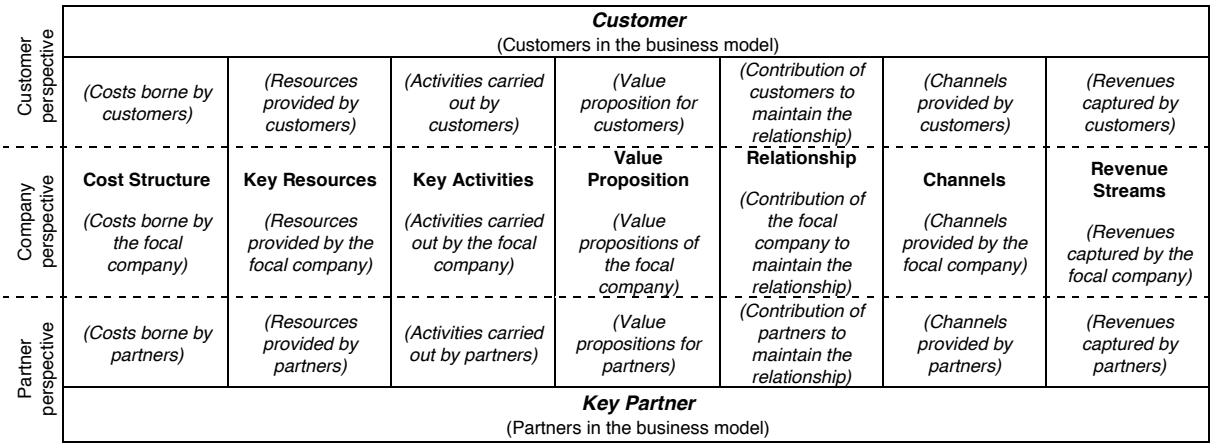

Figure 14: Service Business Model Canvas
Source: own representation

The overall logic is the contribution to and benefit of the business model for each actor. The explicit addition of a customer perspective allows representing co-creation. In contrast to the value proposition of the BMC that illustrates the value proposed to customers of the business model, the value proposition in the SBMC allows representing the value proposed to each actor, including the focal actor. The customer relationship dimension of the BMC was renamed to relationship, because it covers the contribution to maintaining the relationship of all actors. Channels describe the interaction points between actors. The revenue stream dimension presents possible revenues for each actor. Key resources and key activities represent the contribution of each actor to service provision. In particular, these dimension illustrate the contributions of customers to the resources and the process of providing the service. Lastly, the cost structure shows which costs each actors bears as part of the business model.

Considering the literature, an applicable and useful business model approach for service environments must consider the following requirements (Zolnowski & Böhmann 2013):

(1) A comprehensive representation of relationships between the customer and the entire business model.

(2) Representation of the customers' share of costs and revenues.

(3) Representation of the customers' contribution to activities and resources.

(4) Representation of the specific context of a customer. Hereby, the value creation of the customer is emphasized.

(5) Representation of the relationship and channel between a provider and customer showing how these actors co-determine the interaction between them.

Based on these requirements, a service business model emphasizes the possibility of the customer to co-determine or to interact with other elements of a business model. Hence, co-creation of a service must be displayed in a holistic way.

12.3 General research process

12.3.1 Methodology

According to the design science paradigm in information systems research, the novel artifact SBMC must demonstrate its utility, quality and efficacy (Hevner et al. 2004; Peffers et al. 2006). Therefore, the authors conduct the observational method of a case study to profoundly observe the artifact in a business environment (Hevner et al. 2004). As a particular qualitative empirical method a case study investigates "complex, difficulty delimitable phenomena in their natural context" (Wilde & Hess 2007). Thus, the authors perform a case study by means of an app-based proximity m-payment service of the German grocery retailer EDEKA. The case is suited because of its intricacy of being a multi-sided platform, connecting several distinct user groups in a network and creating various values for them by their interaction (Evans 2003; Rysman 2009). By applying the discerning case to both the BMC and SBMC concept, this research demonstrates the applicability of the SBMC in comparison to the BMC. Rather than focusing on the modeling process, this work shows its applicability and identifies limitations to conduct further research.

The research was executed as follows. Based on a literature review, actors in a m-payment service system and factors for their adoption and acceptance were identified. These factors are predictors for a potential usage (Venkatesh et al. 2003) and provide requirements for a service in terms of a desired value configuration. Then both factors and actors have been integrated into the BMC based Mobile Payment Business Model Framework of Pousttchi et al (Pousttchi

et al. 2009). It depicts feasible instantiations of each dimension and enables the analysis of a business model of a mobile payment service.

In a next step, one author was involved in the development process of the EDEKA service. By utilizing the afore-mentioned framework he iteratively analyzed the implicit business model by stepwise investigating each dimension per actor, starting with the focal company and moving on to the remaining perspectives. Here, the pillars for both BMC and SBMC were decorated. In cases where the framework lacked support for peculiarities, the instantiations of both models were extended. The results of each iteration were presented within four workshops where company experts with knowledge in m-payment, m-marketing, and innovation management participated. The experts then discussed the explicated business model dimensions for the BMC and the SBMC in order to check for integrity and to improve the depiction of the developed service business model. After completion two experts with experience in business modeling verified the application of both concepts according to requirements from the literature.

12.3.2 EDEKA case

The increased dissemination of mobile devices, their ubiquity and the convergence of functionality induce interest of merchants to employ them as access devices for retail services. In accordance with their positive emotional connotation they are suited to depict m-payments (Herzberg 2003). For the purpose of this paper, m-payment is defined as a type of handling payments, where in the context of an electronic procedure at least the payer uses mobile communication technologies for initiation, authorization, or realization of the payment (Pousttchi 2003). Amongst others, this comprises scenarios in which all types of traditional commerce and service can be paid locally with help of a mobile device towards an agent of a merchant (Pousttchi 2005). This is expected to overcome current challenges of the retailing industry, notably throughput time at the checkout, costs of cashless payment methods or relative anonymity of customers.

Notwithstanding its high attention, m-payment has not spread widely yet. According to a literature review, success criteria for their diffusion, disruptive potential, criteria for user and merchant adoption as well as enabling technologies have been examined (Dahlberg et al. 2008). Likewise an appropriate business model is seen as factor of success (Pousttchi 2004).

However, m-payment services often lack such a business model so that the service does not create expected value (Au & Kauffman 2008).

In order to co-create a m-payment standard and to be familiar with required processes when m-payment takes-off EDEKA initiated a strategic partnership with a mobile (payment) service provider. Being Germany's biggest grocery retailer, EDEKA generates revenue of EUR 44,6 bn. per year within more than 11.600 stores. Together they launched a proximity m-payment service in May 2013. Built into a mobile application for smartphones it allows payments at the checkout by simply showing a barcode, which is scanned by the checkout personnel or by self-service. Mobile coupons are automatically redeemed during transaction and the payment is settled with direct debiting scheme.

12.4 Description of the business models

In the following, the results of the research process are described. In both solutions, the m-payment service provider is the focal company providing the service to EDEKA. Consumers and self-employed merchants of EDEKA form the customer dimension.

12.4.1 Business Model Canvas of the EDEKA case

Figure 9 contains a BMC based illustration of the results. All acquired information are organized according the nine dimensions of this approach.

Key Partners	***Key Activities***	***Value Proposition***	***Customer Relationship***	**Customer Segments**
-(PSP) Payment service provider -(TP) Technology provider for checkout and terminals	-App development, deployment, and maintenance/operation -(PSP) Transmission of payments for settlement	-(MCH) Decrease of (operational) costs -(CST)(MCH) Payment safety -(CST)(MCH) Payment speed -(CST) Savings by m-marketing (offers and discounts) -(MCH) Customer data	-Acquiring (Explicit merchant acquisition) -(MCH) Issuing by merchant -EDEKA brand	-(MCH) B2B (merchants) -(CST) B2C (direct customers) -Low number of transactions -Low / no willingness to pay -Market segmentation (un-) differentiated
	Key Resources		***Channels***	
	-(TP)(PSP) Tangible resources (payment infrastructure (mobile application, web platform, promotion system, etc.)) -Intangible resources (customer and merchant basis) -Human resources (sales force; product design; software development)		-Mobile app -Web -Store -Advertising and promotion -After sales services (electronic manuals, customer service, …)	

Cost Structure	**Revenue Stream**
-Set-up -Infrastructure -Operation -Advertising and promotion	-Merchant as revenue source / no feed from direct customer -Revenue type - usage fees (transaction-independent (active users) / transaction-dependent (discounts))

CST = Customer, MCH = Merchant, PSP = Payment Service Provider, TP = Technology

Figure 15: Business Model Canvas of the EDEKA case
Source: own representation; Business Model Canvas based on (Osterwalder 2010)

The *value proposition* defines the value of the service. Here, the service offers merchants a decrease of operational costs. For all customers, transactions are fast and safe. By additional

m-marketing possibilities, merchants can make supplementary offerings and discounts. Lastly, customer data can be collected.

Potential *customer segments* are Business-to-Business (B2B), like merchants, and Business-to-Consumers (B2C). For both segments, the number of transaction is rather low and there is a low or no willingness to pay. The differentiation of the consumer market segment is high.

The merchant is in direct contact with the customer and maintains the *relationship*. As far as possible, there is no contact to the customer by the partners. The mobile service provider and all other partners are acting as white brand behind the EDEKA brand.

In the *channels* of the business model, the main element is the mobile application. All purchases are accomplished with the help of the application within the grocery stores. Furthermore, additional interaction is possible with the help of the Internet. Awareness is built based on advertisements and other promotions. Additional after sales services complete the interactions between the service and its customers.

To realize this business *resources* are required. Infrastructure elements, like applications, platforms and systems are necessary to enable the provision of the service. Mostly, partners must provide these resources. Intangible resources, like a customer and merchant basis form the foundation of the service. Furthermore, human resources are needed to enable many activities.

Needed *activities* comprise the confirmation of the payment at the checkout and the direct debit of the monetary amount. For this activity, a payment service provider is necessary. Furthermore, activities surrounding the application are needed.

Some resources and activities need to be provided by *partners*. Payment service providers provide billing and payment expertise. Furthermore, technology providers provide the hardware as infrastructure of the service.

The *cost structure* is mostly derived from needed activities and resources. Costs occur during the set-up of the infrastructure and the system. In addition to this, costs for the infrastructure, operation of the service and advertising and promotion occur.

The main *revenue source* is the merchant. Due to alternative, no-cost payment solutions, the customer has a low or no willingness to pay. Transaction-independent, for active users, and transaction-dependent, for discounts, usage fees are the basis of the generated revenues.

12.4.2 Service Business Model Canvas of the EDEKA case

Figure 3 represents the SMBC. All information are organized in nine dimensions and three perspectives.

		Customer -(CST) Differentiated Business-to-Consumer segments -Low number of transactions / Low or no willingness to pay -(MCH) Undifferentiated Business-to-Business segments -Low number of transactions / Low or no willingness to pay						
Customer perspective	CST	***Cost Structure*** -Debit card -Compatible mobile device	***Key Resources*** -Compatible mobile device -Right of disposal for debit card	***Key Activities*** -Registration -Configuration -Authentication and initiation -Confirmation -Account management	***Value Proposition*** -Payment safety -Payment speed -Savings by m-marketing	***Relationship*** -Registration for automated or self service	***Channels*** -Smartphone with installed mobile app	***Revenue Streams*** -Savings (e.g. monetary and time)
	MCH	-Setup costs and operations (e.g. staff, discounts) -Infrastructure (checkout-system, terminals, connection)	-Tangibles (checkout system, terminal) -Intangibles (right of disposal for merchant account) -Staff	-Configuration -Awareness -Confirmation -Settlement	-Payment safety -Payment speed -Decrease of (operational) costs -Customer data -Customer retention	-Automated or self service -Personal assistance in store	-Web -After sales -Store	-Customer per sale or purchase volume
Company perspective		-Setup costs and operations (e.g. staff, negotiation) - Infrastructure	-Tangibles (payment infrastructure, promotion system, checkout system plugin) -Intangibles (customer and merchant basis) -Staff	-App development, deployment, and maintenance/ operation -Transmission of payments for settlement	-Increased platform sales -Decrease of operational costs	-Integrated into service provision	-Mobile payment system -Mobile app -After-sales (Customer service)	-Usage fees (transaction-independent (active users) / transaction-dependent (discounts))
Partner perspective	PSP	-Setup costs, operations, infrastructure	-Tangibles (payment infrastructure)	-Risk mgmt. -Settlement (direct debiting)	-Increase of sales -Decrease of costs	-Automated service (settlement)	-Web -Sales force	-Usage fees from merchant (transaction dependent)
	TP	-Setup costs, operations, infrastructure	-Tangibles (Checkout system, plugin, terminal)		-Increase of sales	-Personal assistance (distribution)	-Sales force	-From merchant per sale
		Key Partner -(PSP) Payment provider (e.g. bank) -(TP) Technology provider						

CST = Customer, MCH = Merchant, PSP = Payment Service Provider, TP = Technology

Figure 16: Service Business Model Canvas of the EDEKA case
Source: own representation

Because of its interactive characteristic, the provision of a service needs the integration of customers and partners (Zolnowski & Böhmann 2013). The business models' *customers* can be nuanced between differentiated Business-to-Consumer and undifferentiated Business-to-Business segments. All segments have a low number of transactions and a low or no willingness to pay. *Key partners* comprise payment service providers and technology providers.

The first perspective comprises the company itself. In the *value* dimension, the value for the focal company is described. It comprises a decrease of operational costs and increased platform sales. Important aspects for all consumers are fast and safe payments. Additionally, merchants have a decrease of operational costs, can collect customer data, and have an increased customer retention. B2C customers can receive savings by m-marketing programs of the merchants. Lastly, all partners can increase their sales by participating in the service. Payment service providers have a decrease of operational costs.

The mobile payment service provider is integrated into the process of service provision and thus only indirectly visible to the consumers. Customers have to register for all automated and

self-services. Mainly, EDEKA is visible and maintains the *relationship*. Complementary automated services, self-services, and personal assistance are offered for customer relationship. Partners have a relationship by the automated service (payment service provider) and personal assistance (technology partner).

There are different *channels* for service provision. Customers must install the mobile app as a channel. Merchants integrate their website, a store and additional after-sales services. Partners provide sales force and their websites. Lastly, the focal company provides the mobile payment system with its mobile app, and additional after-sales services.

For the provision, some essential *resources* are required. Tangibles, like checkout systems and terminals, intangibles like merchant relations and staff are necessary for service provision. Beyond these, customers have to integrate their own resources. This means for the consumers to provide compatible mobile devices and to mandate debiting. The merchant has to integrate infrastructure, rights and staff. Partners need to integrate different tangible resources like payment infrastructure, and checkout systems.

The *activities* of the focal company comprise the development, deployment, maintenance and operation of the application. This includes also the transmission of payment information for settlement. Customers have to take over all needed activities, to get a running service provision. This includes e.g. registration and configuration. Merchants overtake all activities to arouse awareness and to mange the service provision in their stores. The payment service provider has to take over risk management and settlement activities.

The *costs* for the provision of this solution result from the setup and operation. Furthermore, infrastructure costs exist. Costs for the customers occur from their mobile device and debit card. Merchants have costs for infrastructure, setup and operation. Partners have also costs for setup and infrastructure.

The focal company generates its *revenues* by usage fees that arise transaction dependent or transaction independent. By the application of discounts, direct revenues for the customer are generated during a purchase. Furthermore, time savings are generated. By decreasing operational costs, merchants generate revenues per sale or purchase volume. Partners generate their revenues from the app and thus, transaction dependent.

12.5 Comparison and discussion

12.5.1 Comparison of the results

As shown previously, the final results of the service development process differ in various ways. The BMC considers mainly the service provider for the m-payment system for EDEKA. The SBMC solution has a wider perspective and considers all actors that are necessary for service provision. Hence, this approach differentiates between a customer perspective, a company perspective and a partner perspective.

As already stated, co-creation is one of the main characteristics of a service (Vargo & Lusch 2004; Edvardsson et al. 2010; Grönroos 2011) and thus, must be represented in a business model. As shown in literature (Zolnowski & Böhmann 2013), neither the BMO nor the BMC illustrate the co-creation of a service. The main reasons for this issue are the value chain character and the limited relationships between the dimensions of the BMO.

To enable the representation of co-creation, the structure and relationships of the BMO were reworked. In particular, the relationships between the main dimensions and the actors were extended significantly. This is necessary to meet the requirements from literature (Zolnowski & Böhmann 2013) and thereby to illustrate co-creation.

In contrast to the BMO, where the integration of customer activities is not intended, in the SBMC the combination of extended relationships and different perspectives enable the possibility to represent the impact of different actors on the business model.

The BMC represents a differentiation between distinct value propositions of the customer segments. Therefore, this business model provides different value propositions for different segments. Furthermore, different channels and a specific customer relationship can be assigned to a customer segment.

In contrast to this, the SBMC is designed to represent the full bandwidth of interaction with the customer. The customer is positioned at the top of the business model and has a direct relationship to the main business model dimensions. Supported by the swimlane representation, it is possible to differentiate between the respective value propositions of the company for each actor. Similar to this, in the relationship and channels dimensions a differentiation between the customer's perspective and company perspective can be done. Hence, the SBMC enables its user to identify how the customer co-determines and influences these dimensions

and how the company designs the relationship and channel. In the resource and activity dimensions the co-creation is represented. In the customer perspective, it can be exactly defined, which resources and activities a customer has to integrate to the service provision. Resources and activities of the focal company are represented in the company perspective. Lastly, the customer perspective for revenue streams and the cost structure is represented. Through the integration of activities and resources, costs occur at the customer's side, which are now described in the cost structure. Identical to this, revenues are also generated at the customer's side. These are explicated in the customer's perspective of the revenue stream.

Besides the customer co-creation, also partners play an important role in service business models. The network character of a service is an essential part and comprises the change from a value chain logic to a value network logic (Lusch et al. 2010). Especially in ICT and its multi-sided nature (Evans 2003), the integration of and interaction with additional partners is important. To capture this complexity, an integrated business model framework that helps professionals is necessary (Poel et al. 2007).

In the BMO, only partners integrate activities to the business model. Resources are integrated indirectly based on the included activities. Moreover, a differentiation between the activities and resources of different partners is made. According to the identified relationships (Zolnowski & Böhmann 2013), no further interaction occurs.

By integrating the additional partner perspective, the SBMC addresses these deficiencies and allows visualizing multi-sided networks. The impact of this extension is similar to the impact of the customer perspective. Thus, a specific value proposition for the partner, and the relationship and channels can be defined. Furthermore, the actual integration of resources and activities can be explicated. Lastly, detailed information about occurred costs and potential revenue streams can be determined.

Also, the application during the design process is of interest. In the BMC, different starting points for the development of a canvas are possible. Be it the value proposition or specific customer segments with its needs. In Addition, the SBMC allows starting the design of a business model from different perspectives and dimensions. Example 1 (in Figure 4) shows a design process based on the desired value proposition for the customer. Example 2 (in Figure 4) shows a service development process that starts in the resource dimension of the partners.

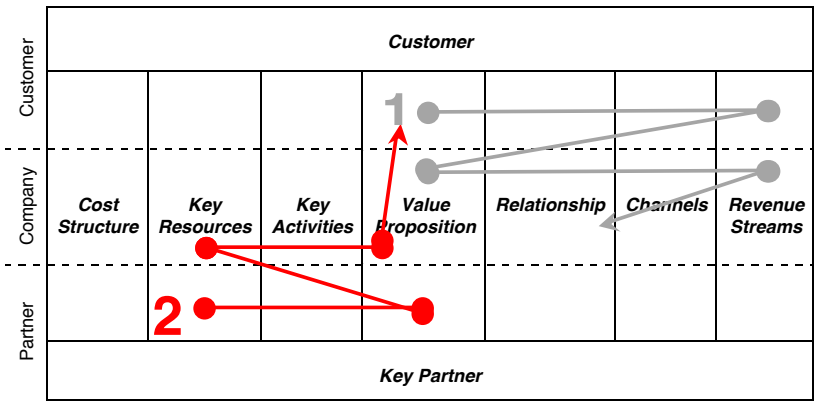

Figure 17: Starting points for the design
Source: own representation

12.5.2 Discussion of the requirements

The application of the SBMC in this case study demonstrates its applicability and efficacy. During its use, a service development team was accompanied. The resulting service was released in May 2013. Next, the SBMC is considered according to the proposed requirements of Zolnowski and Böhmann (Zolnowski & Böhmann 2013).

The *first requirement* postulates a comprehensive representation of relationships between the customer and the entire business model. This requirement is fulfilled by the SBMC. By integrating the customer perspective, all potential interaction points with the customer are visualized. Thus, it is possible to represent the impact of the customer on other business model dimensions. For example, Figure 5 shows, the interaction points between the customer and the business model dimensions cost structure, key resources and key activities. Examples for the interaction comprise the integration of resources and activities of the customer or the selection of channels.

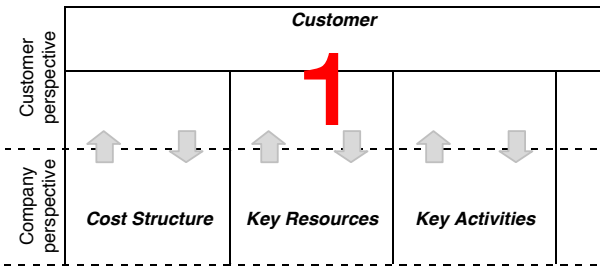

Figure 18: Illustration of the relationships
Source: own representation

To situate the influence of the respective requirement, Figure 6 shows the position of its impact. Thereby, the intelligibility of the following explanation can be improved.

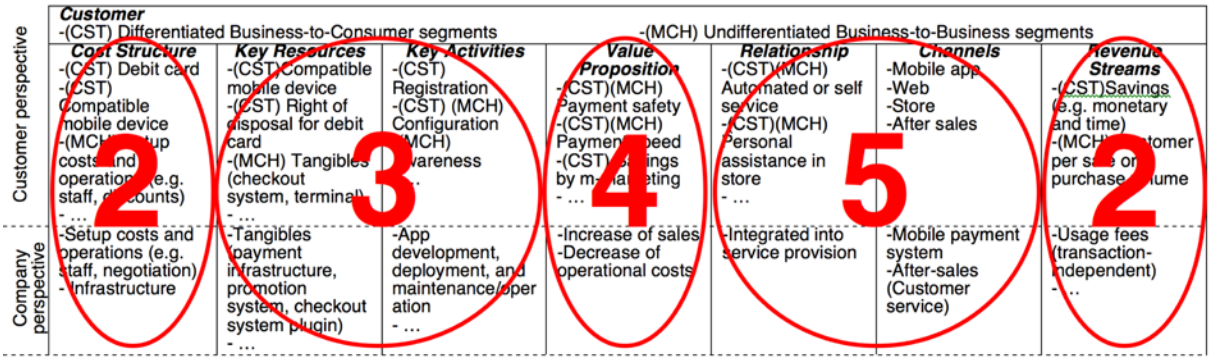

Figure 19: Requirements 2 to 5
Source: own representation

The *second requirement* demands the possibility to represent the share of costs and revenues. As shown in the case study (number 2 in Figure 6), consumers and merchants have a specific influence on the monetary dimensions of the focal company. In the costs dimension, consumers can influence the company's costs e.g. by their choice of a mobile device and hereby, the wish for more compatible software. In this situation, the company has more effort in the development of the software and thus, more costs. On the other side, merchants chose between transaction-dependent or transaction-independent usage fees.

The *third requirement* demands the representation of the customer's contribution to activities and resources. This requirement is also depicted in the SBMC of the case study (number 3 in Figure 6). With his compatible mobile device, the consumer has to integrate own resources into the service provision. Without the mobile device, no service delivery is possible. In the activity dimension, the merchant has to take over activities in his grocery store, e.g. assisting the consumer in the payment process.

In the *fourth requirement*, the integration of the customer's specific context and thus, situation, needs, and wishes is requested (number 4 in Figure 6). Nevertheless, because of the high diversity of value the task to visualize the contextual value of a service is a complex venture. Thus, it is rather not possible to display the contextual value in a comprehensive way. Nevertheless, the SBMC extends the value proposition by the possibility to visualize the customer's value explicitly. Hence, the desired value of the customer, as service-specific characteristic, can be illustrated.

One further point is the emphasis of value for any actor of the service. Because service is a perspective on value creation (Vargo & Lusch 2008), value has a particularly important position in a service business model. By differentiating between the actors and their distinct value

propositions, the value for any actor is emphasized. This is important because in many cases, the benefit is not only limited to monetary aspects. Rather, a long partnership with medium-term and long-term objectives is of importance. The benefit of a value is also important in negotiation processes, when the service provider has to discuss their integration and potential reciprocal benefits with possible partners.

Lastly, the *fifth requirement* requests to represent the customer's contribution to the relationship and channel (number 5 in Figure 6). The focal company is integrated into the service provision and just indirectly visible to the consumer. The merchant has to add services in the store and the customer has to register for himself the service. In the channel dimension, the customer has to install the smartphone app and the merchant has to provide his own channels.

In addition to the published requirements in (Zolnowski & Böhmann 2013), also the integration of partners is of importance. Especially, the multi-sided nature of ICT emphasizes the importance of partners. Furthermore, service ecosystems and thus, the network character of service (Lusch et al. 2010) play an important role in service research. Similar to the customer integration, the SBMC also illustrates the influence of partners on the entire business model.

12.6 Conclusion and outlook

In this contribution, the authors demonstrate the applicability and the efficacy of the Service Business Model Canvas (SBMC), a novel business model approach for service environments. For this, a case study with EDEKA, Germanys biggest grocery retailer, was conducted and the development of a service for a proximity m-payment service accompanied. This service was launched officially in May 2013 in major German cities. By applying this case to both concepts, Business Model Canvas (BMC) and SBMC, this research analyzes and compares the representation of the SBMC and the BMC. Lastly, the case underlines our evaluation by informed argument as it provides the complexity of a real service business model.

This research demonstrates the applicability of the SBMC. In contrast to the BMC, the SBMC offers an extended perspective on service business models. This enables the user to take a holistic perspective on the business logic. Especially when considering service-specific aspects, the SBMC can improve quality of the illustration of the business model.

Nonetheless, related to service-specific aspects, this approach also cannot represent all aspects completely. However, this problem is based on the heterogeneity of service. To visualize con-

textual value and value over time, a holistic business model approach is too static. In order to overcome this issue, a variety of customer segments or different, time dependent versions of a business model are necessary.

Furthermore, when representing network based service business models, the complexity of the SBMC rises significantly. Especially relationships between individual customers and partners cannot be represented easily. Future research can focus on this issue and develop a network-oriented perspective on business models. However, the SBMC was developed to keep the existing advantages of the BMC and to enable the representation of service. The main advantages comprise an easy, intuitive, and compact representation of service business models.

By taking a cumulative stance for the development of a service business model approach, a new comprehensive approach is developed. This solution can help professionals to analyze, illustrate and design service business models with respect to their service-specific characteristics. Additionally, by widening the perspective and defining the impact of customers and partners on their own business model, professionals get a holistic overview of the business logic of a service.

Based on this overview, professionals can identify the interaction points with customers and partners. Professionals are able to illustrate how the focal company can contribute to the customer's business model or how it can collaborate with the customer. Furthermore, developers get hints on how to interact with the customer and which partners must be integrated into the service provision.

This paper contributes to service research by adding replicable methods for the representation of service business models (Ostrom et al. 2010). It offers a tool that helps scholars to analyze, illustrate, and design service business models. Particularly important, this concept can add to the research on the nature of service value and the role of co-creation in service businesses. Additionally, this work contributes to business model research, by the provision of a service-specific business model approach and a service case.

As part of a research project on the analysis and design of service business models, this contribution is one more step to explore service and its business models. So far, the authors have

demonstrated the applicability of a service-specific approach. According to the Design Science Research Process model, in the next step, an evaluation of this concept is necessary.

12.7 Acknowledgement

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13 Formative Evaluation of Business Model Representations

Zolnowski, A., Böhmann, T. (2014): Formative Evaluation of Business Model Representations – The Service Business Model Canvas. European Conference on Information Systems (ECIS), Tel Aviv.

Abstract

Drivers like global competition, advances in technology, and new attractive market opportunities foster a process of servitization and thus the search for innovative service business models. To facilitate this process, different methods and tools for the development of new business models have emerged. Nevertheless, business model approaches are missing that enable the representation of co-creation as one of the most important service-characteristics. Rooted in a cumulative research design that seeks to advance extant business model representations, this goal is to be closed by the Service Business Model Canvas (SBMC). This contribution comprises the application of thinking-aloud protocols for the formative evaluation of the SBMC. With help of industry experts and academics with experience in the service sector and business models, the usability is tested and implications for its further development derived. Furthermore, this study provides empirically based insights for the design of service business model representation that can facilitate the development of future business models.

Keywords

Service, Service Business Model Canvas, Formative Evaluation, Thinking aloud, Business Model Representation

13.1 Motivation

Developing business with service is a key goal and a substantial challenge for many enterprises in today's markets (Eggert et al., 2014). Drivers like global competition, advances in technology, and new attractive market opportunities foster a process of servitization and thus the search for innovative service business models (Neu and Brown, 2008). This development has spawned interest in service innovation and business model innovation in a service context (Chesbrough and Spohrer, 2006, Zott et al., 2011). Methods and tools have emerged that help to shape such developments in a corporate context, in particular for the analysis and design of business models.

Designing such methods and tools for business model analysis in a service context is thus a relevant research challenge. Ideally, robust research should underpin the conceptual foundations and design of methods for the analysis and generation of business models in the service context. Such methods shape our understanding of markets and offerings and thus influence decisions taken in enterprises.

Yet, extant research suffers from limitations with regard to robustness and impact for a number of reasons. For one, despite the popularity of the business model concept, it is not well adapted to service-related transformations and exhibits from considerable conceptual variety. Moreover, there is no scarcity of methods and tools but relatively few examples of cumulative design research. Most authors propose different, but independent methods for the representation and analysis of business models, which add valuable aspects but exhibiting incommensurable design elements (e.g. (Al-Debei, 2010, Bouwman et al., 2005, El Sawy et al., 2008, Gordijn, 2002, Heikkilä et al., 2008, Osterwalder, 2004, Weill and Vitale, 2001, Wirtz, 2001)).

In line with existing discussions in design science (Niederman and March, 2012) and business model research (Zott et al., 2011) that call for more cumulative research, we thus seek to explore a different route for advancing knowledge on business models in this paper. This route emphasizes cumulative design research and works towards evidence-based design of a method for the representation of service business models. Approaches for the representation of business models seek for an illustration based on a composition of textual and graphical elements (Zott et al., 2011). This paper reports on the formative evaluation of a specific representation of service business models, the Service Business Model Canvas (SMBC). Faced

with a formative evaluation that is based on the thinking-aloud method (Ericsson and Simon, 1985), we analyse the users' understanding of the structure and concepts as well as the application of the SBMC. The SBMC representation is an evolution of the Business Model Canvas proposed by Osterwalder and Pigneur (Osterwalder and Pigneur, 2010). We decided to take the Business Model Canvas as a foundation because the underlying Business Model Ontology is originated in IS research (Osterwalder, 2004). Furthermore, it has been widely adopted in research and practice[5]. So our work seeks to advance this extant research by proposing an evolution of the design underlying the business model canvas and subjecting this extension to a first formative evaluation. This formative evaluation is a necessary part of the iterative evaluation phase of the DSRP that considers the artifact during its development, in order to identify areas for improvement and refinement (Venable et al., 2012).

Such an evaluation is also of interest to general research on business model representations as there is general lack of evaluation studies in this area. Rather, most representations are evaluated by providing illustrative case studies (Al-Debei, 2010, Gordijn, 2002, Osterwalder, 2004). However, a few exceptions exist. Voigt et al. evaluate a process-oriented business model method with help of expert interviews in a focus group (Voigt et al., 2013). Based on the work of Poels et al. (Poels et al., 2011), Buder and Felden evaluate the Resource Event Agent model as business model representation in an experiment with 120 business administration and IS students (Buder and Felden, 2012).

Hence, this paper adds to research by answering following questions: "Can the Service Business Model Canvas help to better understand and analyse service business models?" and "How can thinking-aloud protocols support the development of new business model representations?". Answering these questions, this paper contributes to service research by fostering the design of tools for service innovation and proposing a formative evaluation of a service-specific business model approach. This formative evaluation helps to identify areas for improvement and refinement and is conducted during the development of the SBMC. Hence, this paper does not aim on a summative evaluation and thus, does not proof the advantage over another solution. The development of representations contribute to the on-going stream

[5] Academic reception: 869 citations on Google Scholar as of 2013-09-04 compared to 478 citations for e3-value. Proxy for adoption in practice: over 4m Google hits for "business model canvas" compared with less than 32,000 hits for "e3-value"

of research on methods to facilitate the design and engineering of service (e.g. (PatríCio et al., 2008)). Furthermore, this paper contributes to business model research by introducing thinking-aloud protocols (Ericsson and Simon, 1985) for the formative evaluation of business model representations.

This paper is organized as follows. We first introduce our conceptual foundations with regard to business models, service-specific aspects of business models, and, finally, the service business model canvas (SBMC). Then we explain the methodology of the formative evaluation based on thinking-aloud protocols. This is followed by presenting and discussing the results of the evaluation. Based on the results, we derive implications for the formative evaluation of business models and implications for the Service Business Model Canvas. The paper ends with a conclusion and an outlook.

13.2 Conceptual foundation of Service Business Models

13.2.1 Foundations of business models

Despite of its popularity in research and practice, there is still a high diversity in the understanding of business models. As different literature reviews show, there is no overall definition of business models (Fielt, 2011, Zolnowski and Böhmann, 2011, Zott et al., 2011). On the one hand side one could argue that this demonstrates the requisite conceptual variety necessary to do justice to different industries, offering, or organisations. This is already shown in the beginning of business model research, when specific Internet or Information Technology (IT) based business models were considered (Afuah and Tucci, 2001, Ethiraj et al., 2000, Timmers, 1998). The purpose of this research was not to invent business model research, but rather the analysis of the business logic of these specific, novel business models. Based on this diversity, different conceptualizations of business models exist (e.g. (Afuah and Tucci, 2001, Al-Debei, 2010, Zott and Amit, 2007)). One the other hand, we content that the conceptual variety also inhibits research progress. Not all conceptual diversity may be warranted but also the result of the initial exploration of the field with a limited cumulative research tradition (Zott et al., 2011).

Given the conceptual diversity, it is not suprising that there is also a significant diversity of ontologies and representations. Three of the most common ontologies are e3-value Ontology (Gordijn, 2002), the Business Model Ontology (BMO) (Osterwalder, 2004), and the Resource-Event-Agent Ontology (Mccarthy, 1982). Representations can be differentiated in two

research streams. The first research stream comprises a more flow-oriented perspective on business models. A prominent example for this stream is the e3-Value method (Gordijn, 2002). The second research stream comprises, however, a system-level holistic view on the business logic of an economic entity or offering (Zott et al., 2011). The most prominent example for this stream is the Business Model Ontology (Osterwalder, 2004) and the Business Model Canvas (Osterwalder and Pigneur, 2010).

As already stated, the authors emphasize a cumulative design research and work towards evidence-based design of a method for the representation of service business models. For this, this research follows the research stream of a system-level holistic overview on the business logic that explains how to create and capture value (Zott et al., 2011). Belonging to this perspective, the Business Model Ontology and Business Model Canvas offer an existing model that is widely adopted in practice. The Business Model Ontology is the theoretical grounding for the Business Model Canvas and represents a formalization of the elements, relationships, vocabulary and semantics of a business model.

13.2.2 Service-specific aspects of business models

The specific characteristics of service are based in the nature of service. Considering service specific research, like in the service-dominant logic, service is defined as "[...] the application of specialized competences (operant resources - knowledge and skills), through deeds, processes, and performances for the benefit of another entity or the entity itself" (Vargo and Lusch, 2004, Vargo and Lusch, 2008). A similar definition is proposed by Grönroos. He defines service as "[…] a process that consists of a set of activities which take place in interactions between a customer and people, goods and other physical resources, systems and/or infrastructures representing the service provider and possibly involving other customers, which aims at assisting the customer's everyday practices" (Grönroos, 2008). Thus, service is a process that occurs in interaction between different actors and that is applied for the benefit of another party. Especially, the interaction aspect is relevant for service. Known as value co-creation, it is one key aspect of service (Grönroos, 2012). Given its relevance, Vargo identifies co-creation as one of the foundational premises of service (Vargo and Lusch, 2008). Because of this aspect, the value of service depends always on the actors. Thus, service value has a unique and phenomenological character (Edvardsson et al., 2010, Vargo and Lusch, 2008). Furthermore, the interaction of service results in a mutual integration of resources and

activities. Possible resources that have to be integrated are e.g. skills, knowledge, physical resources and decisions (Grönroos and Ravald, 2011, Moeller, 2008).

Considering the Business Model Canvas with regard to its capability for representing the specific nature of service leads to the conclusion that it does not sufficiently reflect all service-specific aspects (Zolnowski and Böhmann, 2011). In particular, co-creation is not represented in the Business Model Canvas (Zolnowski and Böhmann, 2011, Zolnowski et al., 2012). To mitigate these conceptual gaps, the Service Business Model Canvas was developed.

13.2.3 The Service Business Model Canvas

The Service Business Model Canvas (Zolnowski and Böhmann, 2013, Zolnowski et al., 2014),is an adaptation of the Business Model Ontology (Osterwalder, 2004) and the Business Model Canvas (Osterwalder and Pigneur, 2010). This adaptation focuses on the representation of the business logic of service offerings as illustrated in Figure 1. It is separated into three different perspectives (customer perspective, company perspective, and partner perspective) that underline the importance of different actors in a service business model.

The overall logic of the Service Business Model Canvas considers the contribution to and the benefit of the actors in the service business model. By adding the customer perspective, the SBMC allows the representation of the customers' integration and thus the co-creation. The value proposition dimension offers an overview about the value that is proposed to each actor. Thus, the value for customers, partners and the company itself can be represented. The relationship dimension illustrates the maintenance of the relationships between the actors. Channels, however, describe the interaction points between these actors. In the revenue streams dimension, monetary revenues and revenue models are illustrated. On the left side, key resources and activities describe the contribution to the service process. Lastly, the cost structure differentiates between the costs each actor has to bear (Zolnowski et al., 2014).

The SBMC is the object of the evaluation presented in the remainder of the paper.

Customer perspective	***Customer*** (Customers in the business model)						
	(Costs borne by customers)	*(Resources provided by customers)*	*(Activities carried out by customers)*	*(Value proposition for customers)*	*(Contribution of customers to maintain the relationship)*	*(Channels provided by customers)*	*(Revenues captured by customers)*
Company perspective	**Cost Structure** *(Costs borne by the focal company)*	**Key Resources** *(Resources provided by the focal company)*	**Key Activities** *(Activities carried out by the focal company)*	**Value Proposition** *(Value propositions of the focal company)*	**Relationship** *(Contribution of the focal company to maintain the relationship)*	**Channels** *(Channels provided by the focal company)*	**Revenue Streams** *(Revenues captured by the focal company)*
Partner perspective	*(Costs borne by partners)*	*(Resources provided by partners)*	*(Activities carried out by partners)*	*(Value propositions for partners)*	*(Contribution of partners to maintain the relationship)*	*(Channels provided by partners)*	*(Revenues captured by partners)*
	Key Partner (Partners in the business model)						

Figure 20: The Service Business Model Canvas
Source: (Zolnowski et al. 2014)

13.3 Methodology

13.3.1 Thinking-aloud method

Business model representations offer a textual or graphical illustration and thus, facilitate the practical work with business models. For this, the representation requires easily understandable constructs and a manageable structure. In order to facilitate the development of the SBMC and to achieve a usable and useful business model representation, we seek to explore how users understand and use the SBMC. To reach this aim, we adopted the thinking-aloud method as a empirical evaluation method for design methods (Siau and Rossi, 2011).

In general, the thinking-aloud method (Ericsson and Simon, 1985) considers and analyses the application of a tool or method by a user. It is based on work in the area of cognitive psychology and widely used in research for the analysis of human behaviour. Especially in IS research, the thinking-aloud method is often used for the purpose of usability testing (Boren and Ramey, 2000). Nevertheless, the application of this method has diverse goals in different research areas. E.g. in contrast to the cognitive psychology, where the humans' cognitive processes are focussed, in usability testing, deficiencies of system under development are considered. For the purpose of usability testing, this method is commonly used in a later phase of a development process (Wonil and Gavriel, 2010).

In particular, thinking-aloud is a verbal report that is closely linked to the cognitive process of an interviewee, without influencing it. In order to achieve a high qualitative and reliable thinking-aloud protocol, the interviewer has to follow some rules. First, only hard verbal data have to be collected. These data comprise every activity a user attends to. Data about the users

introspection, inference, or opinion are not included. Second, the interviewer has to give detailed instructions before starting the experiment. This is necessary, because the user has to speak fluently, without interruption. Third, during the experiment, the interviewer has to remind the user to keep talking. Lastly, the interviewer do not intervene the user. Thus, beside the reminder to keep talking, no other interaction is allowed (Boren and Ramey, 2000, Ericsson and Simon, 1985).

Regarding to the methodology, in the following, first the participants and their tasks are illustrated. After that, the execution of the thinking-aloud protocol is explained. Finally, the data analysis of the protocols is described.

13.3.2 Participants

According to the 10+-2 rule (Wonil and Gavriel, 2010), this research was conducted with a sample of nine participants. This amount of participants is necessary to discover overall 80% of usability problems. In this setting, the test can be applied to evaluators with a basic training and a limited evaluation time (Wonil and Gavriel, 2010).

In total, we conducted three thinking-aloud protocols with service experts from industry and six tests with service researchers from academia. Thus, all participants had deep knowledge about service and their specific nature. Furthermore, all participants had knowledge with the Business Model Canvas. Nearly all participants were members of a transfer oriented working group on service business models between several international companies and universities. The industry experts came from leading international technology and automotive industries, had several years of experience in service settings, and use the Business Model Canvas in their daily business for analysis and development of new services. All companies were historically product dominated and are currently in a transition process to a more service dominated offering structure. Participants from academia came from different universities and used the Business Model Canvas during their teaching and in their research projects. Nevertheless, most participants were not familiar with the Service Business Model Canvas. Most of the tests were executed as part of a workshop on service business models.

13.3.3 Execution

To ensure the comparability of the results, a standardized setting for all sessions was established. All sessions were conducted individually in separate rooms. During each session, a

voice recording was made. Furthermore, an observer monitored the session and motivated the participant to keep talking. The standardized process began with a short introduction by a video. This introduction comprises a welcome, a classification of the test, a description of the test object, the rules of a thinking-aloud test, and finally a reminder to keep talking.

After the video was shown, the participants got three sheets of paper. The first sheet contains an overall description of the Service Business Model Canvas (cf. Figure 1), with a definition of the possible content of the respective dimensions. Next, the second page (cf. Figure 2) contains the example of a service business model that was applied in the Service Business Model Canvas. This example shows a slightly simplified business model that is based on a case study of a mobile payment service in the retail industry (Zolnowski et al., 2014). Thereupon, the third page contains all questions and tasks that the participants have to conduct.

According to recommendations from literature, if a participant stops talking, after 20 seconds an observer reminds him to keep on talking with a neutral encouraging sound (Boren and Ramey, 2000).

The applied example (cf. Figure 2) consists of a m-payment service in the retail industry. It comprises a multi-sided business service with different actors. The focal company is the payment solution provider that operates the m-payment platform. To implement this solution, different partners are necessary, including in particular a processing provider for the payment transactions, and a technical provider for the hardware. The service is offered to retail merchants as an alternative payment solution.

		Customer - Retail merchants (low number of transactions; low or no willingness to pay)						
Customer perspective	Retail merchants	***Cost Structure*** -Setup and operational costs -Infrastructure	***Key Resources*** -Checkout system, Terminal -Intangibles (right of disposal for merchant account) -Staff	***Key Activities*** -Configuration -Confirmation -Settlement	***Value Proposition*** -Payment safety -Payment speed -Decrease of (operational) costs -Customer data -Customer retention	***Relationship*** -Automated or self service -Personal assistance in store	***Channels*** -Web -Store	***Revenue Streams*** -Customer per sale or purchase volume
Company perspective	Payment solution	-Setup and operational costs (e.g. staff, negotiation) -Infrastructure	-Payment infrastructure, Promotion system, Checkout system plugin) -Staff	-App development, deployment, and maintenance/ operation -Transmission of payments for settlement	-Increased platform sales -Decrease of operational costs through economies of scale	-Integrated into service provision	-Mobile payment system -Mobile app -After-sales services	-Usage fees
Partner perspective	Processing	-Setup and operational costs	-Payment infrastructure	-Risk mgmt. -Settlement (direct debiting)	-Increase of sales -Decrease of costs through economies of scale	-Automated service (settlement)	-Web -Sales force	-Usage fees from merchant
	Techn.	-Setup and operational costs -Infrastructure	-Checkout system -Terminal		-Increase of sales	-Personal assistance (distribution)	-Sales force	-From merchant per sale
		Key Partners -Payment processing provider (e.g. bank) -Technology provider						

Figure 21: Example of a Service Business Model Canvas as basis of the thinking-aloud protocols
Source: own representation

13.3.4 Tasks

In order to conduct the formative evaluation of the Service Business Model Canvas, nine tasks were formulated. All tasks represent problem-solving activities that are common for the use of the model (Ericsson and Simon, 1985, Russo et al., 1989), like the analysis and design of service business models. Overall, we designed tasks with two levels of complexity (Guan et al., 2006). The first tasks have a low complexity and comprise the overall comprehensibility of the example. Thus, the participants had to conduct tasks about the example that reflect their understanding of the example and the overall model. Secondly, tasks with a higher complexity about the representation of co-creation in the SBMC were performed. With that, the aim of the adaption of the SBMC is evaluated.

To achieve successful tests by all participants, all tasks can be carried out independently. Thus, there is no specific sequence of the tasks. This is important, because otherwise participants can get stuck after some tasks.

In particular, the first five questions were designed to evaluate the understanding of the Service Business Model Canvas and the example. The following tasks (six to eight) focus on the co-creation aspect of the Service Business Model Canvas. The tasks are:

1) Which actors are involved in this service business model?
2) What is the value proposition for the customers?
3) Which revenues are captured by partners?
4) Which costs are borne by the focal company?
5) Through which channels does the focal company run the business?
6) How is value co-created:
    a. Which resources are provided by the customer?
    b. Which activities are carried out by partners?
7) What happens if the focal company outsources the development of the mobile application?
8) The payment solution offers a win-win-situation to all business model participants. Please describe the value for the merchant and how this value is co-created.

13.3.5 Data analysis

After conducting the thinking-aloud protocols, verbal transcripts were made. Based on these transcripts, the understanding, navigation, and usage of the SBMC were analysed. The aim of our investigation was to analyse and understand the utilization of the model and to detect usability problems in its application.

Focussing on these aims, we distinguish between different problem types. According to the thinking-aloud protocol on a IT system of Van Den Haak et al., we can differentiate between five problem types (Van Den Haak et al., 2003). These types are layout problems, terminology problems, data entry problems, comprehensiveness problems, and feedback problems. Because this model is not an IT system that gives a direct feedback, we exclude the problem type feedback problems. Furthermore, we revise data entry problems to data manipulation prob-

lems, because we do not design a new business model, but change an existing one. The considered problem types are described in the following.

Layout problems occur if a participant fails to spot an element of the business model representation. *Terminology problems* appear when the participant does not understand terms correctly or use these terms in another way. *Data manipulation* problems exist when the participant does not know how to conduct a change of the entries in the business model representation. Lastly, *comprehensiveness problems* indicate missing information that is relevant for the use of the business model representation.

To evaluate the task performance, we also measure the time that was required to solve all tasks. Furthermore, we consider which tasks were properly completed. In the following, the results of our data analysis are illustrated.

13.4 Results

13.4.1 Task performance

The average duration of all sessions was 9 minutes and 21 seconds, with the longest duration of 15 minutes and 28 seconds and the shortest duration of 5 minutes and 1 second. Table 3 summarizes the results and illustrates the successful completion of task and the average duration per task.

Tasks	number of interviewees that complete the task properly	mean	median	standard deviation
1) Actors in the SBMC	6	53 sec.	35 sec.	45 sec.
2) Value proposition of the customer	8	43 sec.	26 sec.	41 sec.
3) Revenues of partners	9	30 sec.	31 sec.	9 sec.
4) Costs of the focal company	9	32 sec	25 sec.	19 sec.
5) Channels of the focal company	9	26 sec	22 sec.	10 sec.
6a) Resources of customers	9	44 sec.	36 sec.	25 sec.
6b) Activities of partners	9	30 sec.	24 sec.	15 sec.
7) Outsourcing of development	7	1 min. 42 sec.	1 min. 20 sec.	41 sec.
8) How is the value co-created	5	2 min. 24 sec.	2 min. 36 sec.	1 min. 12 sec.
Overall		9 min. 21 sec.	8 min. 25 sec.	3min. 46 sec.

Table 17: Task performance

Overall, as shown in Table 3 the amount of properly completed tasks during the applications of the SMBC was satisfactory. The main tasks that were designed to evaluate the understand-

ing of the Service Business Model Canvas (tasks 3, 4, 5) were always successfully completed. Three participants failed at task 1, because they just differentiated between the three perspectives customer, company, and partner. Thus, they failed to differentiate between the processing and technology partner within the partner perspective in the example. The participant that failed task 2 had difficulties to understand the example. As he thought of this example as a business-to-customer business model, for him the Value Proposition was difficult to understand.

The following tasks considered the co-creation aspect of the Service Business Model Canvas. As already expected, the average processing time increased for these questions. Because tasks 6a and 6b were simpler regarding co-creation they were always answered successfully. Two participants failed task 7 because they were not able to imagine the impact of the considered outsourcing on the example. Lastly, four participants failed task 8 for different reasons that are considered in the following section.

13.4.2 Detected problems

In the following, occurred problems in the thinking-aloud protocols are illustrated. As introduced in the data analysis section, we differentiate between layout problems, terminology problems, data manipulation problems, and comprehensiveness problems.

Overall, four participants conducted the complete test without any problems. One participant had problems in the beginning of the test. Once, he was familiar with the model, he was able to conduct all tasks correctly. Two participants had only problems with the last question. Lastly, two participants had problems with the first and the last both tasks. Based on these findings, we can assume that most problems were on an individual level. Most participants had no or less problems with the overall model.

Layout problems were mainly detected with the first task of our thinking-aloud protocols. Three out of nine participants did not successfully differentiate between the four actors retail merchant, payment solution provider, processing provider and technology provider. Two participants only read the headlines of the three perspectives. For example, one of our participants said, “Obviously, we have three different perspectives: company, partner, and customer”. Another participant considered only the other actors in the business model. This participant said, “Retail merchants are the customers. And then, there are also the processing

and technology partners. Are there any other actors? There should be only actors on the top and on the bottom of the model."

In general, all participants had no problems with the layout. During the first few seconds, the participants had to receive a lot of information from the example. But, after a short time, the participants were familiar with the structure of the SBMC. Nevertheless, a pure visualization of information is rather difficult to handle. Thus, one participant stated, "Maybe some kind of visualization of the whole concept would be of great benefit. Because […], when I try to describe a business model with too much formatting and structure, it is difficult to see what is really behind."

Also the navigation through the layout was of interest. During our test, we observed the way the participants applied the SBMC. Furthermore, we analysed the transcripts for indicators that describe the application. We found that all participants navigated first on the vertical axis and then on the horizontal axis. Hence, the first action was to differentiate between the different perspectives and then between the dimensions. Typical sentences in our transcript are, "I'm reading the partner perspective in the lower section of the paper. On the right, looking on the revenue streams for technical and processing partners". Only a few times, the participants varied from this navigation and looked at the dimensions first.

Terminology problems appeared with the term co-creation. Despite of the participant's knowledge of service, statements like "[…] how is value co-created. Oh gosh. Co-created" indicate that not all participants really knew what co-creation means or which impact co-creation has on service business models. Furthermore, the understanding of co-creation was rather divergent. This was shown by the fact that participants considered different dimensions during their co-creation tasks. One participant with a focus on activities said, "Co-creation is really an activity. So, there are different roles and activities that need to be done to co-create the value". For comparison, another participant with a broader focus said, "I would say that the value is from the customer perspective is payment safety, payment speed, decrease of operation costs, customer data, and customer retention, and the key activities that are co-creating this value […]. Then we have the app development that is carried out by the company. And both bring in key resources in terms of payment infrastructure, and the company in terms of staff as well. I also think they have some co-creation regarding the channels they are using. Yeah. It depends so much, what you really into, how the value is co created". A third partici-

pant expands the discussion on co-creation by noting, “Of course, you could argue that both, the partners and the company, provide the infrastructure. They do the processing and they provide the technology. Value is realized, when customers’ customer buy something of this”. This means that value co-creation is more than providing activities and resources.

Observing the *data manipulation* in task 7 shows mostly no problems. Two participants failed this task because they were not able to image the impact of the considered outsourcing on the example. In this case, the participants said, “What happens if the focal company outsource […] the mobile application? (short break). What happens? Then we have a problem (laugh)”. Most of the participants, however, solved the task correctly. Nevertheless, there was still a divergence in the processing of this task. Some participants considered mainly the left side of the SBMC and thus, resources, activities, and costs. Other participants considered all dimensions of the focal company and evaluated the influence of the outsourcing.

Lastly, we searched for *comprehensiveness problems*. In our thinking-aloud protocols were no indicators for missing elements in the SBMC. Rather, the high amount of elements increases the complexity of the SBMC in comparison to the BMC. The complexity is facilitated by the basis of the BMC. As one participant mentioned, “[…] I do recognize the cost structure, key resources - all these dimensions are familiar to me […]. So its probably the same”.

13.5 Discussion of the results

The formative evaluation of the Service Business Model Canvas helps to develop a usable and useful business model representation of service business models. As we could observe during our thinking-aloud protocols, the decision to conduct cumulative research on basis of the BMC has some relevant advantages. The reason is that the BMC is a widely adopted approach in academia and practice. This helps practitioners as well as academics to understand the adapted model. Thus, it helps to reduce initial barriers for users unacquainted with the SMBC. With this knowledge, also a more complex task like the outsourcing (task 7) was handled easily by most participants.

The results show that the participants could navigate through the SBMC and that the elements were mostly easily accessible. Furthermore, the representation could facilitate the identification of the different actors in the model. Especially, if more than one actor was involved in the customer or partner perspective. A simplified visualization could emphasize this as well as the

relationships between different elements in the model. This would support the understanding of the SBMC.

The evaluation shows, however, that users struggle with the concept of co-creation and its representation in the SMBC. Even if most participants completed the co-creation tasks in a proper way, the improper answers call for a more detailed focus on co-creation. A detailed definition of co-creation in the SMBC could facilitate the adoption of the SBMC. One answer to this problem is proposed by Grönroos (Grönroos, 2011). According to his work, value co-creation should be strictly focused on the customer's creation of value-in-use. Other actions that enable value for the customer, should be seen as value facilitation (Grönroos, 2011). This means that value creation always occurs in the customer perspective on the value proposition dimension. All other interactions between the different actors facilitate the overall creation of value. Hence, it is important to emphasize the customer in a comprehensive way. In particular, when designing co-creation, an intensive investigation of the customer is required. This investigation comprises the analysis of all customer dimensions to derive the general conditions. Based on this information, the co-created value can be designed. Thereupon, dimensions of the focal company should be considered.

Furthermore, a strict focus on co-creation can help to design a user manual or walkthrough through the SBMC. If the co-created value occurs always in the value proposition dimension of the customer perspective, we can define paths how the model can be filled. For example, we could start in the key activities dimension of the focal company, go to the activities of the customer and can derive the value proposition for the customer. Another way could be to start with the desired value proposition of the customer and with his activities, to derive activities and resources that the focal company must provide.

Overall, the application of a thinking-aloud protocol as a method for the formative evaluation was informative and gives hints for further development of the SBMC. In contrast to existing literature in business model research that focuses on a more summative evaluation (e.g. (Al-Debei, 2010, Buder and Felden, 2012, Gordijn, 2002, Osterwalder, 2004)), this contribution emphasizes a formative evaluation. Hence, existing knowledge from usability testing is applied to support the design and development of practicable business model representations.

The overall results of thinking-aloud protocols illustrate how users apply a business model representation and if the special adaption of this representations has the predicted impact.

Hence, academics can evaluate if the purpose of the representation is achieved. Otherwise, hints can be derived that help to improve the considered approach.

To achieve all necessary information, a distinction between different problem types (layout problems, terminology problems, data manipulation problems, and comprehensiveness problems) is needed. This helps to focus on relevant problems in the application of business model representations. Based on this information, the applicability can be improved and with that, the acceptance in the practice can be enhanced.

13.6 Conclusion

In this contribution, a formative evaluation of the Service Business Model Canvas (SBMC) is conducted. For this purpose, the thinking-aloud method (Ericsson and Simon, 1985) was applied. This method is originated in the area of cognitive psychology, used in research for the analysis of human behaviour, and widely applied in usability testing (e.g. software, interfaces, and documents). Based on the results of this test, implications for the SBMC and the formative evaluation of business model representations are made.

Based on a cumulative research approach, the SBMC offers an adaption of the Business Model Canvas (BMC) that is specialized on the representation of service business models. With that representation, users are able to display the business logic of service in a holistic way. This is of importance, because of service-specific characteristics, like co-creation, mutual resource and activity integration, and the unique and phenomenological character of value.

In order to evaluate the practicability and analyse the application of the SBMC, this thinking-aloud protocol was conducted. The overall results show a good comprehensibility by the participants. Users that are already familiar with the BMC, can easily switch to the SBMC and apply it for the representation of service business models. Nevertheless, despite of its similarity to the BMC, the complexity of the SBMC is higher. The reason for this is the differentiation between three different perspectives (customer, company, and partner perspective). Hence, this complexity is a first challenge that all users must deal with. Furthermore, a second challenge is the meaning of co-creation. This is, because not all users have the same understanding of co-creation. According to Grönroos (2011), however, co-creation always occurs in the value proposition of the customer perspective. All other activities are just facilitating the overall value in the business model.

More valuable information is derived from the navigation and data manipulation in the SBMC. The participants of the test navigate mostly first vertically, through the perspectives, and than horizontally, through the dimensions. This information can help to design a user manual and walkthrough for the SBMC. Furthermore, this information helps to evaluate the benefit for the user of the business model representation.

This contribution also shows how to conduct a formative evaluation of a business model representation. Until now, most publications on business model representations and on the evaluation of business models focussed on a summative evaluation. In our opinion, thinking-aloud protocols offer a possibility to support the development of new business model representations by a formative evaluation.

Thus, this paper contributes to business model research, by applying the thinking-aloud method for the development of business model representations. This helps to include the user in the development and thus, to achieve artifacts with a high utility for achieving its purpose. Hence, academics are supported to conduct substantial research and to obtain tools and methods with a high operational capability. This paper also contributes to service research, by adding replicable methods for the representation of service business models (Ostrom et al., 2010).

Based on the results of the thinking-aloud results, we found out that the SBMC helps professionals to identify interaction points and thus, to understand the co-creation with customers and partners. Professionals are able to illustrate how the focal company can contribute to the customer's business model or how it can collaborate with the customer.

Nevertheless, also some limitations have to be considered. This paper summarizes results of a cumulative research project on service business models. Due to its research design according to the DSRP, only completed parts of the entire research process can be presented. In the current research stage, the SBMC was formative evaluated. This is necessary to identify possible aspects for improvement and refinement of the artifact. The evaluation was conducted according to the 10+-2 rule by Wonil and Gavriel (2010) that helps to discover overall 80% of usability problems. With more than nine thinking-aloud tests it could be possible to identify further issues. However, the identified issues reflect our experience in the application of the SBMC. Due to the formative character of this evaluation, in a next step, a summative evaluation is necessary. Within the summative evaluation, it is necessary to extend the perspective on usability and to evaluate the advantages of the SBMC against other approaches. Possible

evaluation approaches are discussed in business model research (Voigt et al., 2013, Buder and Felden, 2012), method engineering (Becker et al., 2008), and design science research (Venable et al., 2012).

As part of a research project on the analysis and design of service business models, we have to include the results of this research to the next step. After that, an empirical evaluation of this concept is necessary.

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14 Designing Services with Business Model Representations

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Abstract

Facilitated by advances in technology and attractive market opportunities, the development of innovative service business models is an important goal for many companies. To assist the innovation process, different methods and tools for the development of new business models have emerged. However, extant business model approaches are missing a representation of service-characteristics like co-creation and contextualization, limiting their value for innovating service business models. Based on a cumulative research design that seeks to advance extant business model representations, this shortcoming is to be redressed by the Service Business Model Canvas (SBMC). This paper re-ports on the naturalistic evaluation of the SBMC. For this purpose, a focus group session method was performed that considered the use of the SBMC for designing, understanding, and analyzing co-creation in service business models. Furthermore, this study shows insights into the application of business model representations in the development process of services.

Keywords

service, business models, evaluation, service business model canvas

14.1 Motivation

In the last years, the importance of service as a key concept in information systems has grown continuously (Böhmann et al. 2014). Also in today's markets, service is a key goal and a substantial challenge for many enterprises (Chesbrough & Spohrer 2006; Eggert et al. 2014). Especially, the digitalization fosters the emergence of innovative services in Information Technology (IT) (Veit et al. 2014). To establish these innovative services on a market, the development of innovative and sustainable business models is necessary (Chesbrough 2011). Inspired by this development, interest in business model innovation in a service context emerged (Chesbrough & Spohrer 2006; Zott et al. 2011; Böhmann et al. 2014).

Justified by this development, the design of methods and tools that enable the analysis of business models in a service context is a relevant research challenge. By creating conceptual foundations, tools, and methods for the analysis and generation of service business models, research can create valuable knowledge. Such content shape our understanding of markets and offerings and thus influence decisions taken in enterprises.

Considering current business model research, several limitations can be identified with an influence of its robustness and impact. For one, despite the popularity of the business model concept, it is not well adapted to service-related transformations and exhibits from considerable conceptual variety. Moreover, there is no scarcity of meth-ods and tools but relatively few examples of cumulative design research (Zott et al. 2011; Kundisch et al. 2012). Most authors propose different, but independent methods for the representation and analysis of business models, which add valuable aspects but exhibiting incommensurable design elements (e.g. (Weill & Vitale 2001; Wirtz 2001; Gordijn 2002; Osterwalder 2004; Bouwman et al. 2005; El Sawy et al. 2008; Heikkilä et al. 2008; Al-Debei 2010)).

Due to the variety of different conceptualizations, methods, tools, and in line with existing discussions in design science (Niederman & March 2012) and business model research (Zott et al. 2011; Kundisch et al. 2012), which call for more cumulative research, we seek to explore a different route for advancing knowledge on business models in this paper.

The overall target of this cumulative research aims on the development of a business model representation for service business models. Business model representations seek for the illustration of a business logic based on a composition of textual and graphical elements (Zott et al. 2011). To achieve this goal, an evolution of the Business Model Canvas (BMC) (Oster-

walder & Pigneur 2010), the Service Business Model Canvas (SBMC) was developed (Zolnowski & Böhmann 2013). The BMC is based on the Business Model Ontology (BMO) (Osterwalder 2004), was created in association with a large number of practitioners, and is a widely adopted business model representation in research and practice. The BMO is originated in Information Systems research and proposes a conceptualization of business models with its semantics and relationships. As an evolution of the BMC, the development of the SBMC emphasizes a cumulative design research, which works towards evidence-based design of a method for the representation of service business models.

This paper reports on the naturalistic evaluation of the SBMC, which is situated in a research project according to the Design Science Research Process (Peffers et al. 2008). Hereby, the SBMC is the artifact of this research. Faced with a focus group session (Stewart et al. 2007), as an ex post, naturalistic evaluation method, we explore the performance of the proposed artifact in its natural setting. With that, our work seeks to advance this extant research by examining the utility of the artifact and thus, proving if the design artifact achieves its purpose (Venable et al. 2012).

Such an evaluation is also of interest for general research on business model representations. In contrast to most representations that are evaluated by providing illustrative case studies (Gordijn 2002; Osterwalder 2004; Al-Debei 2010), this research proposes a naturalistic evaluation that is facing real people, real systems, and real settings (Sun & Kantor 2006). Enriched by a differentiated observation of the understanding, analysis, and design, as typical functions of business model representations (Kundisch et al. 2012), we analyzed the use of the SBMC. So, we do not just evaluate the utility of the SBMC, rather, we got insights into the application of business model representations in the development process of service business models.

Hence, this paper adds to research by answering following question: “Can the Service Business Model Canvas help to better understand, analyze, and design service business models?” Answering this question, this paper contributes to service research by giving insights into the service design process with business model representations and proposing a naturalistic evaluation for the representation of service business models. The development of representations contribute to the on-going stream of research on methods to facilitate the design and engineering of service (e.g. (Patrício et al. 2008)). Furthermore, this paper contributes to business

model research by applying a focus group as evaluation method of business model representations.

This paper is organized as follows. We first introduce our conceptual foundations with regard to business models, service in business models, and the SBMC. Then we explain the evaluation methodology that is based on focus groups. This is followed by a presentation of the results of the focus group session. Based on the results, we derive implications for the design of service business models and summarize the evaluation results for the SBMC. The paper ends with a conclusion and an outlook.

14.2 Theoretical foundations

14.2.1 Business models

Due to its novelty, research on business models is quite fragmented. As different literature reviews show, heterogeneity exist i.a. with regard to its conceptualization, definition, and use (Fielt 2011; Zolnowski & Böhmann 2011; Zott et al. 2011). In regard to this heterogeneity, one could argue that this demonstrates the requisite conceptual variety necessary to cover different industries, offering, or organizations. This variety coincides with the beginning of business model research, where specific Internet or IT based business models were considered (Timmers 1998; Ethiraj et al. 2000; Afuah & Tucci 2001). The purpose of this research was to add to business model research by analyzing the business logic of specific, novel business models. Based on this diversity, different conceptualizations of business models emerge (e.g. (Afuah & Tucci 2001; Zott & Amit 2007; Al-Debei 2010)). In contrast to this, you could also argue that the conceptual variety also inhibits research progress. The conceptual variety could be also the result of the initial exploration of the field. Furthermore, the variety can show a limited cumulative research tradition (Zott et al. 2011).

Due to the heterogeneity, a significant diversity of ontologies and representations exists. Three common ontologies are the e3-value Ontology (Gordijn 2002), the Business Model Ontology (BMO) (Osterwalder 2004), and the Resource-Event-Agent Ontology (McCarthy 1982). The representations can be differentiated in different research streams. On the one hand, it comprises a more flow-oriented perspective on business models. A prominent example for this stream is the e3-Value method, which takes a more flow-oriented perspective on business models (Gordijn 2002). On the other hand, this research stream comprises, a system-level holistic view on the business logic of an economic entity or offering (Zott et al. 2011). A

prominent example for this stream is the Business Model Ontology (Osterwalder 2004) and the Business Model Canvas (Osterwalder & Pigneur 2010).

Because of the existing critic on the heterogeneity and the lack of cumulative work in business model research (Zott et al. 2011; Kundisch et al. 2012), the authors emphasize a cumulative design research and work towards evidence-based design of a method for the representation of service business models. Within this research, business models offer a system-level holistic overview on the business logic that explains how to create and capture value (Zott et al. 2011). Therefore, this cumulative research is based on the BMO and the BMC as widely adapted model in research and practice. The BMO represents a formalization of the elements, relationships, vocabulary, and semantics and is the theoretical grounding for the BMC.

14.2.2 Service in Business Models

The emergence of service-dominant logic (Vargo & Lusch 2004) and the service logic (Grönroos 2006) marks a paradigm shift and underlines the rising importance of service. This shift is accompanied by an ongoing transition from goods oriented to service oriented business models, in order to establish new opportunities for innovation (Böhmann et al. 2014).

However, this shift also arises challenges for business model research. Service has specific characteristics that are based in the nature of service. According to the service logic, value is contextual and created in collaboration (Edvardsson et al. 2010; Böhmann et al. 2014). Considering service definitions, like from service-dominant logic, it is defined as "[...] the application of specialized competences (operant resources - knowledge and skills), through deeds, processes, and performances for the benefit of another entity or the entity itself" (Vargo & Lusch 2004, 2008). A rather similar definition is proposed by Grönroos. He defines service as "[…] a process that consists of a set of activities which take place in interactions between a customer and people, goods and other physical resources, systems and/or infrastructures representing the service provider and possibly involving other customers, which aim at assisting the customer's everyday practices" (Grönroos 2008).

As shown by these definitions, service is a process that creates value in interaction between different actors. Especially this collaboration is of interest, which is also known as value co-creation and designated as one of the foundational elements of service (Vargo & Lusch 2008). Furthermore, because of the collaboration between the actors and hence, the often unique con-

figuration of skills, knowledge, and resources, the value of service is contextual. Also decisions lead to a unique service result (Moeller 2008; Grönroos & Ravald 2011). Hence, service value has a unique and phenomenological character (Vargo & Lusch 2008; Edvardsson et al. 2010).

Considering the BMC with regard to its capability for representing the specific constellation interactions and resources leads to the conclusion that it does not sufficiently reflect service-specific aspects (Zolnowski & Böhmann 2011). In particular, the interaction between a customer and provider and thus, co-creation is not represented in the BMC (Zolnowski & Böhmann 2011). To mitigate these conceptual gaps, the SBMC was developed.

14.3 Service Business Model Canvas

Based on a cumulative research approach, the SBMC (Zolnowski & Böhmann 2013; Zolnowski et al. 2014), proposes an adaptation of the BMO (Osterwalder 2004) and the BMC (Osterwalder & Pigneur 2010). This adaptation focuses on the representation of service offerings and therefore, offers a system-level holistic overview on the business logic that explains how to create and capture value (Zott et al. 2011). As illustrated in Figure 1, the solution is divided into three perspectives. The customer perspective, company perspective, and partner perspective. These perspectives distinguish between the contributions of the actors and thus, underline their interaction.

The overall logic of the SBMC considers the contribution to and the benefit of the actors in the service business model. By adding the customer perspective, the SBMC allows the representation of the customers' integration and thus the co-creation. The value proposition dimension offers an overview about the value that is proposed to each actor. On these grounds, the value for customers, partners and the company itself can be represented. The relationship dimension illustrates the maintenance of the relationships between the actors. Channels, however, describe the interaction points between these actors. In the revenue streams dimension, monetary revenues and revenue models are illustrated. On the left side, key resources and activities describe the contribution to the service process. Lastly, the cost structure differentiates between the costs each actor has to bear (Zolnowski et al. 2014).

The SBMC is the object of the evaluation presented in the remainder of the paper.

Customer perspective	***Customer*** (Customers in the business model)						
	(Costs borne by customers)	*(Resources provided by customers)*	*(Activities carried out by customers)*	*(Value proposition for customers)*	*(Contribution of customers to maintain the relationship)*	*(Channels provided by customers)*	*(Revenues captured by customers)*
Company perspective	**Cost Structure** *(Costs borne by the focal company)*	**Key Resources** *(Resources provided by the focal company)*	**Key Activities** *(Activities carried out by the focal company)*	**Value Proposition** *(Value propositions of the focal company)*	**Relationship** *(Contribution of the focal company to maintain the relationship)*	**Channels** *(Channels provided by the focal company)*	**Revenue Streams** *(Revenues captured by the focal company)*
Partner perspective	*(Costs borne by partners)*	*(Resources provided by partners)*	*(Activities carried out by partners)*	*(Value propositions for partners)*	*(Contribution of partners to maintain the relationship)*	*(Channels provided by partners)*	*(Revenues captured by partners)*
	Key Partner (Partners in the business model)						

Figure 22: Service Business Model Canvas
Source: (Zolnowski et al. 2014)

14.4 Evaluation Method

14.4.1 Selection of the Evaluation Method

The evaluation of an artifact is a central and crucial activity in the Design Science Research Process (Peffers et al. 2008). During an evaluation, the output of a research process is examined (Venable et al. 2012) with regard to its utility, quality, and efficacy (Hevner et al. 2004). More comprehensively, Hevner (Hevner et al. 2004) elaborates the artifact's evaluation in terms of "[…] functionality, completeness, consistency, accuracy, performance, reliability, usability, fit with the organization, and other relevant quality attributes".

As defined in the Strategic DSR Evaluation Framework (Pries-Heje et al. 2008), the evaluation approach has to be selected according to two dimensions. The first dimension differentiates between an "ex ante" or "ex post" evaluation and the second dimension between a "naturalistic" or "artificial" evaluation (Pries-Heje et al. 2008).

In order to differentiate between these dimensions and to define the evaluation method for the artifact, we applied the Four-Step Method for DSR Evaluation Research Design (Venable et al. 2012). Hence, to conduct an evaluation of the SBMC, as a business model representation that is applied as tool for analysis and design of business models, we chose an ex post, naturalistic evaluation method. By conducting this evaluation, we explore the performance of the proposed artifact in its natural setting. Thus, we are facing real people, real systems, and real settings (Sun & Kantor 2006).

Due to the typical application of business model representations in workshop settings, we decided to conduct focus groups. Hence, we select a similar approach like Voigt et al. (Voigt et al. 2013).

14.4.2 Focus Group Evaluation

Focus groups belong to the common research tools in the social sciences and are used as exploratory as well as confirmatory method. In particular, a focus group is a group discussion between 6-12 people that discuss a specific topic under the supervision of a moderator (Stewart et al. 2007). The discussion is focused on a specific topic and hence, allows the collection of rich qualitative data (Tremblay et al. 2010). In order to evaluate the SBMC, as artifact of this research, we conduct confirmatory focus groups (Tremblay et al. 2010) that emphasize a naturalistic application of the designed artifact. In doing so, the results of this evaluation show the utility of the SMBC and thus, that the design artifact achieves its purpose (Venable et al. 2012).

Sample. In order to evaluate the application of our artifact, we select an IT infrastructure and consulting company that currently develops a new service for its customers. The company operates mainly in Germany, has about 500 million Euro turnover (2013), and around 2.000 employees. Because of the importance of this new service, we were able to conduct a focus group with seven experts. To obtain a comprehensive insight into the company and to get all relevant information for the design of the business model, we selected experts in leading positions with a highly heterogeneous background. The covered departments are Solution Design, Project and Requirements, Shared Infrastructure, Marketing and Sales, IT Service Design, Virtual Infrastructure, and Operating Systems and Infrastructure.

Focus Group Procedure. The focus group session had a duration of 3 hours and 30 minutes, with a short break of 15 minutes. The target of this session was to develop and discuss potential service business models for the future business of the company. According to the typical functions of business model representations, the focus group session was structured in four stages (cf. Figure 2), (1) introduction, (2) design, (3) understanding, and (4) analysis. They are described in the following.

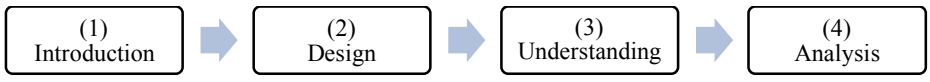

Figure 23: Stages of the focus group session
Source: own representation

(1) In the introduction stage, firstly, we highlighted the targets of the session. Additionally, we introduced the current situation of the company's service business and the target of the desired service business. Thereupon, all participants introduced themselves, in particular their position in the company and expectations for the session. As next step, we encouraged the participants to generate ideas for promising services. All ideas were shortly discussed, and prioritized. Then, two ideas were selected for further development. (2) In the design stage, the participants were divided in two sub-groups that developed service business models for the selected ideas, based on the SBMC. To reduce the complexity (Zolnowski & Böhmann 2014), the design process started with a company centric perspective. The customer and partner perspective were hidden. Based on our workshop design we use the SBMC like the classic BMC of Osterwalder and Pigneur (Zolnowski & Böhmann 2013). Once, we have gone through all dimensions, the perspective was broadened and all interactions and the customer's influence on the own service business model were analyzed. By this, we explicitly focused on the co-creation aspect in service business models and thus, investigated the enhancements of the SBMC. A summary of all questions is illustrated in Table 1. After that, (3) in the understanding stage, both groups got time to analyze und understand the service business model of the other sub-group. (4) Thereupon, in the analysis stage, both service business models were introduced and discussed. Lastly, one service business model was selected for further development.

	Dimension	Question	Time
Traditional BMC dimensions	Customers	Who are our customers?	10 minutes
	Value Proposition	What is the value we want to offer to the customer? What could be our value?	15 minutes
	Key Resources	What do we need to offer the desired service?	7,5 minutes
	Key Activities	Which activities have to be carried out?	7,5 minutes
	Channels	How do the actors interact?	5 minutes
	Relationship	Why do the customers want to stay with our company?	5 minutes
	Revenues Streams	How do we earn money with this service?	10 minutes
	Cost Structure	What are cost drivers?	5 minutes
	Key Partner	Which additional partner, do we need to realize the service business model?	5 minutes
SBMC	Co-Creation in all dimensions	Who is responsible for each of the elements? Which contributions of the customer are missing?	30 minutes

Table 18: Design process of the service business model (stage (2) of the focus group)

In order to examine the feasibility of the focus group procedure, we have performed a pre-test. Within this pre-test, we validate the usability of the questions and all prepared materials.

Data Collection and Analysis. To get all relevant information, the focus group session was recorded with multiple devices. During the design process of the service business models, we made separate video recordings of both groups. The discussion was recorded as video and audio. Furthermore, pictures were made of all notes and results. After the focus group session, the recordings were transcribed, coded, and analyzed using the qualitative content analysis according to Mayring (Mayring 2010).

14.4.3 Evaluation Criteria

The evaluation criteria of the artifact are determined by its applicability. Business model representations have a broad applicability (Kundisch et al. 2012) and thus, have to be evaluated in different ways. Typical functions of business model representations can be distinguished between understanding, analysis, and design (called as innovation in (Kundisch et al. 2012)). To evaluate the applicability and utility of the SBMC, we particularly considered the modified structure and the use of the different perspectives in the design, understanding, and analysis stage.

The first evaluation criterion is the *design*. With that, the ability of the SMBC is evaluated which covers a structured development of an idea into a business model. To analyze this criterion, stage (2) of the focus group session has to be considered. Based on an idea, the participants had to develop a service business model with the SBMC. To check the quality of the results, the participants had to assess the service business model at the end of the session. Furthermore, we focused the procedure in the design process. This is of importance, because of the complexity of service businesses. Based on these observations it is possible to assess, if the development process is able to structure the design and reduce the complexity of the application of the artifact.

The second evaluation criterion is the *understanding*. This criterion considers the ability of the participants to understand a service business model represented with the SBMC. This is the case, if the participants are able to understand and explain the main idea of the business model. In order to analyze this criterion, stage (3) in the focus group setting was conducted. Hence, we allocated time to each sub-group for creating an understanding of the service business model of the other sub-group. After this time, we asked one participant to explain and

discuss the main idea of the other service business model. Based on the explanation and the discussion, a general group understanding of the designed service business model has to emerge.

The third evaluation criterion is the *analysis*. On the basis of this criterion we investigate, if the artifact can facilitate a comparison and discussion of service business models. To examine this criterion, stage (4) of the focus group session was conducted. After a common understanding of the service business models emerged, the participants had to discuss their ideas. The utility as analysis tool is validated, according to its ability to facilitate the discussion and comparison.

14.5 Results and Discussion

14.5.1 Design

The data for the application as a design tool was mainly collected in the video recordings of the session. Within these recordings the use of the SBMC is examinable.

To reduce the complexity, we separated the design process in two steps. Firstly, we applied the SBMC with a company perspective. Within this perspective, we applied the SBMC like the classic BMC and hid the customer and partner perspective. Thus, we sequentially showed the questions from table 1. All questions were discussed within the groups and facilitation cards were hung on the pin boards. Both sub-groups filled the company perspective of the SBMC step by step. After this, the customer perspective was introduced and the co-creation in both service business models was analyzed. With that, the modified structure and the enhancements of the SBMC were evaluated. Guided by the co-creation questions from table 1, the participants revised the existing facilitation cards by taking the responsibility into account. Some of the facilitation cards were in the responsibility of the customer and other in the responsibility of the focal company. Furthermore, when we discussed the responsibilities, the participants saw gaps in their service business models and added new facilitation cards to the customer perspective on the pin boards. According to the results of the process, the participants show a positive response. One participant stated, “[…] the results are valuable and especially conclusive. For me, both models are very interesting”. Another participant added, “You have a fairly complete picture of what you want to do”. Lastly, one participant summarized, ”What we have done here, that's really good. Especially, when you use it as preparation for a business case and as a test. […] Right now I can say, we do not need to pursue a model

where there is no value proposition for the customer. That's because they would have no reason to buy it. This is transparent in this representation. I think, only if you can fill almost all the fields above and below, you can generate a business model that really works".

14.5.2 Understanding

The understanding of a business model is a second function of the SBMC. For this, the participants had to investigate an unknown business model and describe the relevant elements (Osterwalder et al. 2005). At the beginning of this task, one of the participants was worried. The following statement shows this feeling: "I have investigated the business model. But, I don't think I'm well prepared for this task. No". Another participant just started to describe the service business model element by element. For this, the participant navigated through the dimensions, like in the design process (see table 1). While reading the service business model, the participant asked the other sub-group for more detailed information, e.g. "Yes, at the top there is the customer. […] You have written […] no end customer. […] For this element we have a question." To inform the understanding of the participant, the developers of the business model stated "For us, it is not relevant how many users or servers exist. Rather, we say that IT is a part of the production process. Thus, it is not like a person that is doing his job, e.g. painting walls, and using IT to manage his finance. It is more like IT as a part of the production process". With that, the explaining participant gathered information, in order to aggregate it to a complete picture of the service business model. The discussion was necessary, because of the abstract design of the elements on the pin board. Thus one participant mentioned, "This confirms my problem with this. I have the feeling that the topics [respectively the facilitation cards on the pin board; added by the authors] are very abstract […]". Due to this, an explanation of the facilitation cards was required.

The explanation and discussion of the second service business model ran quite similar to the first run. During the second run, the participant correctly explained the whole service business model of the other sub-group. This was also approved by a comment of this sub-group, "That's it. Exactly". However, also after this explanation a discussion occurred that investigated the designed service business model in more detail. This discussion challenged the existing facilitation cards on the pin board and therefore, improved the general understanding of the second service business model.

With respect to the customer perspective and co-creation, the customer-provider interaction was an integral topic of both runs of the explanation and discussion. Because of the differentiated view of company and customer perspective, all participants were forced to think about the influence of the customer on the own service business model. The interaction between both actors was determined by a customer centric value propositions like “knowledge of the market”, resources like “service managers with specific knowledge”, and customer centric revenue streams like “pay-per-value”. Statements like, “No, I’m serious! What [value; note by the authors] I will really get?” emphasized a discussion from a customer perspective.

14.5.3 Analysis

The analysis is the third criterion we have considered. Here, the designed business model is the object of evaluation (Osterwalder et al. 2005). Hence, we observed the discussion of the designed service business model. In particular, we discuss the essential parts of one selected service business model and compare them with each other (Osterwalder et al. 2005).

The comparison of the business models resulted in a discussion. So one participant mentioned “Both models differ significantly from each other, because we have a different design. We [respectively our service business model; added by the authors] use any other service. We even provide our own services only in a row with the other services. But [in the other business model; added by the authors], the customer’s requirements are most important. Therefore we need consulting services. We integrate that, what fits best for the customer”. Another participant added to this by “Yes, I think this is the main difference. On one side, we understand what the customer wants and that we need an individual solution for the customer. On the other side, we see e.g. that five customers have the same requirements. So we build a solution and offer this to the customers”. In the analysis, the participants compared both solutions to each other, analyzed the value for and the co-creation with the customer, and discussed a possible implementation in the current business of the company. According to the resulting design one participant stated, “So the matches [between the models; note by the authors], are very clear. The meaningfulness to lead both models together is also not to question. But speaking about the realization probability I have concerns”. So, the participant mentioned that a simultaneous implementation of both service business models would be to complex. One participant added to this, “I would spontaneously say that this would be a panacea, which has the character of ‘is never finished’”. Nevertheless, a sequential realization of the designed models is possible.

After the business models were compared to each other and analyzed with respect to their implementation possibilities, essential design elements were defined. These elements represent requirements that are necessary for a successful implementation of the service business model. Besides internal resources of the company, like special skills and knowledge about the market, also customer insights are needed. In order to get this knowledge, the company has to conduct customer workshops. According to this, one participant suggested, "[…] we could specifically go to a customer and say, lets conduct a workshop […]. How do I [respectively the customer; note by the authors] imagine the next few years". And as far as the customer uses the service, the customer can individually define his services in a self-service portal.

14.5.4 Discussion of the Results

According to the participants, the execution of the focus group was successful. Statements like "[…] I'm amazed that we developed something valuable within three hours. This alone is really worth it that we apply this method regularly. Because, the more often you do this, the greater is the likelihood to get a ground breaking idea". Another participant agreed to this by "I find the result also very valuable. […] The results should not disappear in a drawer, unnoticed". Also for the researchers, the results were satisfying. The SBMC was executed in its natural environment and therefore, with real people, in a real system, and within real settings (Sun & Kantor 2006).

In the design process, the reduction of the complexity was particularly important. Because of the interaction of different actors in one service, the business model is quite more complex than a traditional product centric business model. As already mentioned by Zolnowski and Böhmann (Zolnowski & Böhmann 2014), this complexity is difficult to manage and requires an adapted procedure. With our approach, the design of both service business models ran smoothly. Guided by different questions (see table 1), all participants executed the tasks sequentially and filled the SBMC element by element. In particular, from the company perspective, the discussions were fast and easy to handle. After the introduction of the second perspective, the participants had to change their thinking. From this point, the participants had to revise the existing elements on the pin boards and think from a customer's perspective. In the first minutes it was a real challenge. However, after some minutes the participants admitted this new perspective and completed their service business model. Hence, by adding this new perspective, the SBMC encourages the participants to expand their usual, company centric perspective, to a more service adequately customer centric perspective.

Focusing on the understanding, as another target of a business model representation, the SBMC successfully facilitates the understanding of the participants. As well as in the design process, also the understanding of the service business model can be facilitated by the provision of a mental structure. Thus, in order to assist the overall understanding and to reduce the complexity, business model representations have to propose structures for reading and designing business models. Otherwise, the user reads the elemental information, but could have problems to interpret them correctly.

Another important factor that influences the understanding is the background of the respective participant. A person from a technical department described the first service business model, by navigating through the dimensions element by element, always discussing the meaning of a single element in the overall picture. The second person had a marketing background. During his description, he focused on the whole picture and told us the overall story, of course, always with respect to the individual elements of the service business model. This phenomenon shows the heterogeneity of the participants and their differences in the application of business model representations. In order to overcome potential problems and to exploit the heterogeneity of users, workshop groups should be as heterogeneous as possible.

During the description of both service business models, the entire group was caught in a discussion. Thereby, the SBMC was used as a communication element. The discussion led the participants to question the existing elements and to verbalize the actual meaning of the facilitation cards. Finally, the application of the representation was very fruitful and supported a common understanding of the results in the entire group.

According to the analysis of both service business models, the SBMC enabled the participants to compare the targets. Based on a discussion und comparison, the participants adopted a strategic perspective on their idea. Firstly, this perspective helped them to situate their ideas against each other. Secondly, by integrating the customer perspective, the SBMC forced the participants to think from a customer's perspective. Affected through a internal strategic and customer perspective, the participants discussed the implementation of these services. As a result they considered that the implementation process should be divided into two steps. Firstly, they would implement the solution that comprises an extensive interaction and co-creation with the customer. The main target of this step is to learn from the customer and to derive desired services for further development. After that, the other service business model could be

implemented. This solution would use the collected data to implement further customer specific services. By analyzing and comparing business models with a business model representation, people can learn in different ways. On basis of this, decision can be derived that foster business development in a structured way.

In the next step, essential design elements were discussed and defined. Thereby, the participants discussed internal as well as external elements that are necessary for the implementation of the service business model. With help of the SBMC, a discussion of the co-creation between the focal company and customers was possible.

There is still one issue: The quality of the resulting service business model. Due to its roots as a qualitative approach, the SBMC helps the user to structure his thoughts and to derive a service business model in a structured way. The problem is the free approach of generating data and filling the canvas. Hence, the quality always depends on the setting and the people that use the SBMC for their purpose.

14.6 Conclusion and Outlook

In this research, a naturalistic evaluation of the Service Business Model Canvas (SBMC) is conducted. For this purpose, a focus group session (Stewart et al. 2007), as an ex post, naturalistic evaluation method was performed that explored the performance of the proposed artifact in its natural setting. Therefore, this research proposes a naturalistic evaluation of a business model representation that is facing real people, real systems, and real settings [22]. Furthermore, enriched by a differentiated analysis of typical functions of business model representations, we analyzed the application of the SBMC. Thus, we got insights into the application of business model representations in the development process of service business models. Based on the gained data, the SBMC was evaluated and implications for the development of services with business model representations were derived.

The development of the SBMC is based on calls for more cumulative research in business models (Zott et al. 2011; Kundisch et al. 2012) and thus, offers an adaption of the Business Model Canvas (BMC). Specialized on the representation of service business models, the SBMC offers a possibility to display the business logic of service. This is of importance because of service-specific characteristics, like co-creation, mutual resource and activity integration, and the unique and phenomenological character of value (Vargo & Lusch 2008).

The obtained data from the focus group session show the utility of the artifact in the three typical functions understanding, analysis, and design. On basis of the SBMC, the participants developed and discussed two potential service business models for the future business of the company. They generated a common group understanding of the designed service business models. And they analyzed both solutions, by comparing them to each other and deriving essential elements for their implementation. These observations were also confirmed by the participants that draw a positive conclusion about the method, proceeding, and results. Thus, we are able to prove that the design artifact achieves its purpose in its natural environment.

Furthermore, this contribution shows implications for the development of services with business model representations. As shown in the focus group session, the participants use a business model representation as communication tool to create a common understanding within the group. This is especially important, to overcome the heterogeneity of the users. However, this heterogeneity also leads to possible advantages. By increasing the heterogeneity in working groups, it is possible to enhance the quality of the resulting business model. Considering service business models in particular, their complexity is often higher than in traditional product oriented business models. For this, a service specific approach, like the SBMC, helps to expand the usual perspective of the users and leads to better results. To handle the complexity, it is necessary to propose procedures that help to better apply the business model representation. Lastly, our session shows that business model representations help to derive implications for development and implementation.

This paper contributes to business model research by conducting a focus group session for evaluation of a business model representation. This helps researchers to design naturalistic evaluations and thus, to better justify their research results. Furthermore, this paper gives insights into the design of services with business model representations. This paper also contributes to service research, by adding replicable methods for the representation of service business models (Ostrom et al. 2010).

Nevertheless, some limitations have to be considered. This paper shows results of a cumulative research project on service business models. Due to our research design according to the Design Science Research Process (DSRP) (Peffers et al. 2008), only single steps of the entire research process can be presented. In the current research stage, the SBMC was evaluated.

After this evaluation, a summarizing contribution has to be developed that condenses the results of all steps of the DSRP.

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Appendix: Final Declaration

Hiermit erkläre ich,

Andreas Zolnowski, geboren am 17. Juli 1982,

an Eides statt, dass ich die vorliegende Dissertationsschrift

„Analysis and Design of Service Business Models“

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 _____ _____

Unterschrift