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FORMATIVE EVALUATION OF BUSINESS MODEL REPRESENTATIONS - THE SERVICE BUSINESS MODEL CANVAS

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Complete Research

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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

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 practice1. 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 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.

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[1] 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"

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.

2 Conceptual foundation of Service Business Models

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.

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.

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 1.   The Service Business Model Canvas

3 Methodology

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.

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.

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.

		Cost Structure	*Key Resources*	*Key Activities*	*Value Proposition*	*Relationship*	*Channels*	*Revenue Streams*
Customer perspective	Retail merchants	*Customer* - Retail merchants (low number of transactions; low or no willingness to pay)						
		-Setup and operational costs -Infrastructure	-Checkout system, Terminal -Intangibles (right of disposal for merchant account) -Staff	-Configuration -Confirmation -Settlement	-Payment safety -Payment speed -Decrease of (operational) costs -Customer data -Customer retention	-Automated or self service -Personal assistance in store	-Web -Store	-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 2. Example of a Service Business Model Canvas as basis of the thinking-aloud protocols

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?

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.

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 problems, 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.

4 Results

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 3.   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 understanding 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.

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 participant 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".

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.

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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