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A Method to Guide the Concretization of Costs and Benefits in Service-Dominant Business Models

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Abstract. Contemporary organizations increasingly transition to a service-orientation to better cater to the needs of customers. To offer the resulting complex service solutions, organizations collaborate in business networks to exchange services, which are typically conceptualized by means of service-dominant business models. As business models influence organizational performance, novel service-dominant business models should be evaluated with respect to how value in terms of costs and benefits is captured per actor. However, limited support is present in literature to guide the concretization of costs and benefits in networked, service-dominant settings to assess the viability of the model. In response, we propose a method to guide the concretization of costs and benefits in service-dominant business models. Building upon existing work in terms of networked value capture, we introduce design parameters to concretize costs and benefits and consequently guide the concretization of these parameters by means of a structured process.

Keywords: service-dominant business model, information governance, business model viability, business model evaluation

1 Introduction

Stimulated by factors such as globalization, rapid technological change and digitization, we see that many organizations transition to a service-orientation of business to offer novel value to customers or to better cater to customer needs. For instance, in the manufacturing domain, organizations such as Kone or IBM increasingly focus on servitization to extend current product offerings in order to create novel value or to enhance existing value propositions [1]. Similarly, driven by advances in IT, we observe that digital companies such as Netflix and Spotify move away from a sole focus on key product offerings (e.g. movie DVDs or music) and aim to provide digitally-enabled, integrated service solutions to better cater to the needs of customers [2].

To reduce the complexity that underlies these service-based solutions and to foster business agility with respect to offering services, many organizations engage in

collaborative business networks, in which organizations exchange services and integrate resources to co-create value [3], [4]. The configuration of these networks in terms of actors in the network, resources deployed and services exchanged consequently defines how value is co-created.

Typically, the business model concept is used to conceptualize these service-driven collaborative networks, describing the logic of how value is created and captured by the network and what resources are leveraged or exchanged to support the business model [5]. Accordingly, these *service-dominant* business models can be used to explore how new service-driven business collaborations should be configured or structured, and how the resulting business model is positioned vis-à-vis strategy and operational processes. Business models are argued to influence organizational performance [6], which calls for the viable design of novel business models in terms of the balance of costs and benefits captured through participation [7].

In contrast to traditional business models, which typically reason from the perspective of a single focal organization, each actor in the business network of service-dominant business models is essential towards the co-creation of value. Accordingly, novel service-dominant business model designs should yield or establish a viable or acceptable scenario (in terms of costs and benefits) for *all* actors in the network. However, service exchange between actors towards the co-creation of value logically results in reciprocal costs and benefits [3], which in turn may result in opposite or conflicting desires, requiring negotiation in order to adequately concretize these costs and benefits. Moreover, especially in competitive settings, actors may not be inclined to share sensitive knowledge or make explicit strategic motives towards their concretization. As a result, this complicates the design and concretization of service-dominant business models, which consequently may threaten the performance of novel, collaborative service-driven initiatives.

Although tools and techniques have been proposed for the *design and representation* of service-dominant business models [8], [9], whereas some research has focused on the *evaluation* of network-oriented business models [10], [11], limited support is present in literature with respect to guiding the concretization of costs and benefits that are the result from participation in service-dominant business models, taking into account the need for governance in terms of how information is shared between actors in the business network and in what context (e.g. publicly shared or restricted to a set of actors). Such support in turn would help users or decision makers to evaluate novel service-dominant business models, exploring under what settings the business model is viable. In response, we pose the following research question to address this gap:

"How can the concretization of costs and benefits that result from the participation in service-dominant business models be supported to support its subsequent analysis?"

In this paper, we propose a method for guiding and analyzing the costs and benefits of service-dominant business models. The method entails a process description that is built upon three layers of knowledge to govern how information is shared in the network to concretize costs and benefits. On the basis of these layers, we introduce design parameters for the concretization of costs and benefits, for which the process description offers guidance on the steps taken to concretize these design parameters.

The remainder of this paper is structured as follows. Section 2 describes the background to our research and details how value is captured in service-dominant business models. In Section 3, we introduce the method and elaborate on the steps taken. Section 4 illustrates the working of the method. We conclude and summarise this paper in Section 5, making explicit how we aim to further improve the method.

2 Research Background

This section discusses the research background for this research. Specifically, we elaborate on the *design* of *service-dominant business models* and how *value is captured* within these business models.

Design of service-dominant business models – A business model describes the logic of how value is created and captured and how this is supported through its organizational and architectural infrastructure [5]. In contrast to traditional business models, which take the perspective of a single organization and focus on the novel recombination of internal and external resources and capabilities to propose value, service-dominant business models are explicitly *networked* in nature and focus on how value is co-created through service exchange between actors in the network [2].

Several tools have been proposed for the design and representation of service-dominant business models. For instance, Zolnowski et al. [9] propose the SDBMC, which is based on the Business Model Canvas [7] and takes the concepts of SDL at its basis, and accommodates users to represent the business network as 'stacked' BMCs. Contrastingly, Turetken et al. [8] propose the SDBM/R, which consists of a circular template taking the co-created value at its core, and enables users to map how actors in the business network contribute and capture value through participation. Given its descriptive power in terms of the business network, we use the SDBM/R for representing service-dominant business models for the remainder of this paper.

Value capture in service-dominant business models – Value co-creation in service-dominant business models is based on service exchange, which results in reciprocal costs and benefits for the actors involved for the exchange [3]. The concretization of these costs and benefits depends on the perception and preferences of both actors involved for the exchange, and typically result in conflicting or opposite motives and desires. Accordingly, this requires negotiation to support the concretization of these costs and benefits. Next to this, costs and benefits may moreover be irrespective of exchange, and be the result of the performance of the entire network or business model (such as the corporate image generated through business model participation), or may solely relate to a single actor (such as operational costs). Note here that costs and benefits can be financial, but also non-financial in nature [2]. The balance of the total set of costs and benefits captured per actor consequently determines whether for the respective actor the business model design is viable or acceptable, which also depends on the strategic goals of the respective actor. For service-dominant business models to be viable, this property should hold for *all* actors in the business network.
Reypens et al. [12] propose a conceptual process for value capture in networked

collaborations. Their work identifies two layers of concern, namely the *network* layer and the *stakeholder* layer, between which information is shared to support value capture. Value is co-created on the network level (for which all actors in the business model are involved) which results in actor specific costs and benefits that concern the stakeholder layer. However, using solely these two layers does not accommodate communication and information exchanges between *subsets* of *actors* that participate in a business model, such as the case for service exchange. The method we propose in the present study supports all three layers by its design.

3 Method Description

The proposed method entails a structured process description that guides actors for a service-dominant business model to concretize their respective costs and benefits, explicating how information is shared across the network. The balance of costs and benefits consequently obtained makes explicit how well each actor in the business network performs, allowing actors to judge whether this is viable or acceptable [7]. Although costs and benefits may be financial and non-financial in nature, the intangible and subjective nature of non-financial costs and benefits makes it difficult to quantify these in a structured way. Therefore, we support the concretization of the financial costs and benefits and contrast the resulting balance per actor to any non-financial benefits or costs that are also captured by this respective actor. Each actor should then judge whether the total balance of costs and benefits (e.g., both financial and non-financial) is acceptable.

As the backbone to our method, we first introduce the structure needed to support the concretization of costs and benefits obtained from participation in the service-dominant business model, addressing the need for increased governance on how information is shared and used. On the basis of this structure, we derive design parameters for the concretization of financial costs and benefits and describe via a step-wise process how these design parameters are concretized in a structured way.

3.1 Information Sharing Structure and Associated Design Parameters

Concretizing costs and benefits per actor resulting from a service-dominant business model design depends on the information that is needed to concretize or quantify these costs and benefits and where this information exists, which should be shared such that each actor can understand the balance of costs and benefits they accrue from participation. Taking into account that not all actors are willing to share sensitive information across the entire network [13], this demands a structure that supports the governance and sharing of information in service-dominant business models, which serves as the backbone for our concretization process.

Next to the *network* level and *actor* level (which we denote as *public level* and *private level* for the remainder) views identified for conceptualizing value capture in networked settings [12], we introduce a third level, the *restricted level*, which accounts for information that needs to be shared to support the concretization of costs

and benefits as a result of service exchange between two or more actors. Accordingly, information for the concretization of costs and benefits can exist on the *public level* (visible to all actors in the business network), *private level* (visible to only a single actor) and on the *restricted level* (only visible to those actors that are involved for a particular service exchange). As such, in case sensitive information is shared for concretizing costs and benefits as a result of service exchange, this information can be shared on the *restricted level*, such that it is not visible to other actors in the business network.

Based on these levels of concerns, we derive three design parameters that are used to concretize and quantify the financial costs and benefits of the value model underlying the service-dominant business model: *public parameters*, *restricted parameters* and *private parameters*. *The public parameters* are concretized by all actors in the network, and are used for public costs and benefits or provide the context for the concretization for restricted or private costs and benefits. For instance, a public parameter may refer to the number of expected customers of a service (if decided upon collaboratively), which in turn may affect how costs and benefits as a result of service exchange (restricted level) are quantified.

The *restricted parameters* are used to costs and benefits as a result of service exchange and are concretized by multiple-actors, those that are involved for the respective service exchange. As an actor may partake in multiple service exchanges in a service-dominant business models, the costs and benefits for these exchanges are to be concretized using different restricted parameters for each of these.

The *private parameters* are used to concretize private (actor specific) costs and benefits. Logically, only the actor that concerns these costs and benefits is able to concretize the associated private parameters.

3.2 Process to Guide the Concretization of Costs and Benefits

Through the highlighted structure, sharing of information is governed by means of the design parameters, which in turn serve as the building blocks for the concretization of the costs and benefits captured from participation in a service-dominant business models. To guide the concretization of these design parameters and consequently the costs and benefits captured, we follow the process description illustrated in Fig. 1. In the following subsections, we will elaborate on each step.

1. Determine information required to concretize costs and benefits

As a first step, each actor should determine what information is needed to concretize their respective costs and benefits and how this information is obtained, such that the costs and benefits can be translated into *public, restricted* and *private* parameters. For instance, the concretization of costs a result of service exchange may depend on information that is present at the other actor partaking in service exchange, such as the price this respective actor desires to set for offering the service or the frequency by which the service is paid for. Such information accordingly should be represented by *restricted parameters* to facilitate concretization of the costs and benefits per actor. Similarly, as costs and benefits may depend on the number of expected customers to

the service offered for the business model, which may be collaborative discussed on the *public level*, *public parameters* are required to effectively capture this information. Therefore, the goal of this step is to understand how the costs and benefits can be concretized through the set of design parameters. As this step may concern *private parameters* as well, it is positioned on the *private level* of concern.

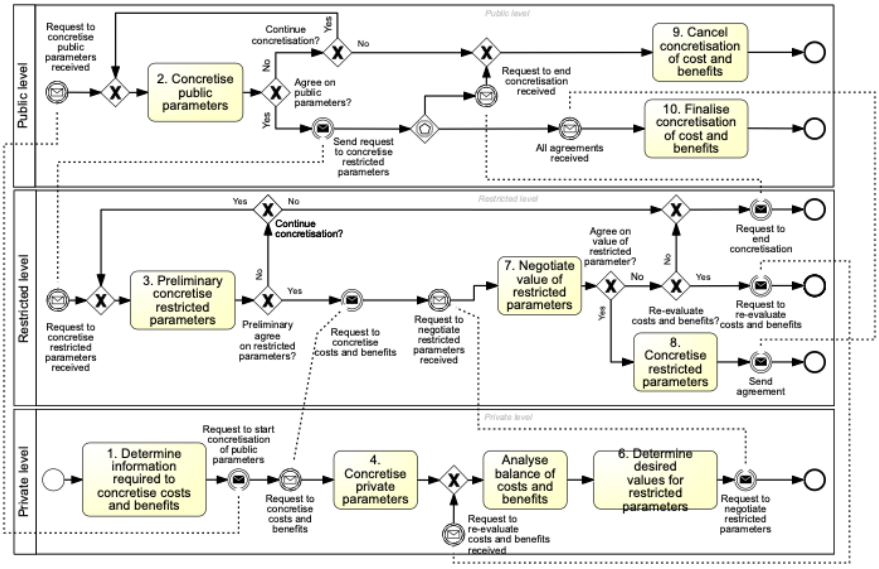

Fig. 1. Step-wise process for concretizing costs and benefits in service-dominant business models

2. Concretize the public parameters

Next, actors collaboratively discuss and concretize the set of public parameters. As the public parameters concern all actors in the business network, it is positioned on the *public level*. Accordingly, actors share information publicly and collaboratively decide on what values are set for these parameters. As illustrated, this is an iterative step that may feature several rounds before the business networks agrees on the value set for the public parameters. In case no agreement is found on public parameters, the concretization process is terminated, requiring the business model design to be reconsidered.

3. Preliminary concretize the restricted parameters

The third step entails the preliminary concretization of restricted parameters and is positioned on the *restricted level*. As such, it only concerns those actors that are involved for a specific service exchange. Note that an actor in a service-dominant business model may partake in many service exchanges (and therefore require multiple restricted parameters to concretize the associated costs and benefits). The concretization is preliminary as actors should first analyze the total balance of costs and benefits to truly understand what settings of restricted parameters are desired.

Nevertheless, as described for the process, the preliminary concretization of the restricted parameters may require several iterations to be concretized and may even make apparent that no viable or acceptable scenario can be found (as for instance the strategic preferences in terms of parameter settings for both actors involved are too distant).

4. Concretize private parameters

The fourth step entails the concretization of private parameters. As these parameters are only visible to and decided upon by a single actor, this step is positioned on the *private level*. Based on information that is available in-house, each actor determines what value should be set for these parameters, taking into account any information derived from the *public* and *restricted parameters*.

5. Analyze balance of costs and benefits

Once the values for the *public, restricted* and *private parameters* have been concretized, the resulting value of the costs and benefits should become apparent, which allows each actor to analyze the balance of the costs and benefits captured under the current settings. This should make explicit whether a viable or acceptable scenario is established for a respective actor, or whether settings (particularly for the restricted parameters) should be changed. As this analysis only concerns a single actor, it is positioned on the *private level*.

6. Determine desired values for restricted parameters

The next step involves what-if analysis with respect to the values set for the restricted parameters, to explore the balance of costs and benefits under different values for the restricted parameters. This is especially relevant in cases for which the initial values set (as explained for step 5) did not result in a viable scenario. Through what-if analysis, each actor can determine under what settings of the restricted parameters (which are subject to negotiation) a viable business scenario can be obtained. As this step is positioned on the private level, this exploration is not visible to other actors, such that actors do not necessarily have to share strategic motives or preferences.

7. Negotiate value of restricted parameters

Taking into account the knowledge obtained through step 6, the respective actors partaking in service exchange negotiate on what *final* values should be set for the restricted parameters. As illustrated by the process, this represents an iterative task with different outputs. In case both actors are able to agree on the value of restricted parameters, the process progresses to the next step. However, in case no agreement can be found, actors may be required to re-evaluate their balance of costs and benefits and to consider either different values for the respective restricted parameter or even different restricted parameters (involving different actors). In case negotiations break down, this may even result in termination of the concretization process, requiring the business model design to be altered.

8. Concretize restricted parameters

If both actors for a specific service exchange agree to a certain value for the restricted parameter, the restricted parameter accordingly can be concretized. Consequently, this agreement (without disclosing the value set) is forwarded to the public level.

9. Cancel concretization of costs and benefits

As explained, if concretization or negotiation on parameter settings break down, the costs and benefits accordingly cannot be concretized, which implies that the business model design should be reconsidered or altered (as either no agreement can be formed or no viable scenario can be obtained for all actors in the business network).

10. Finalize concretization of costs and benefits

Once an agreement has been received for all *restricted parameters*, which implies that under the current settings of the parameters each actor obtains a viable business scenario, the concretization process can be finalized. The final settings of the parameters consequently can be taken as a basis to further operationalize or implement the business model design. Logically, once the business model design becomes increasingly concrete, data availability increases, which facilitates parameters to be more accurately predicted or forecasted, potentially requiring the process to be revisited.

4 Illustrative Application of Method

To illustrate the working of the method, we apply the method to a practical case study. The case study focuses on providing a bike-sharing solution in large cities in Europe, which typically requires the integration and exchange of services between actors such as the *bike sharing service provider (BSSP)*, *municipality* and *bike maintenance provider (BMP)*. This collaboration can be represented through a service-dominant business model as illustrated in Fig. 2 (modelled using the SDBM/R [8]). As illustrated by the model, each actor captures value in terms of costs and benefits from participation, which should be concretized to assess the viability or performance of the business model design, for which we apply the proposed method. For this example, we focus specifically on the perspective of the BMP and the maintenance service it offers to the BSSP to ensure that bikes continuously can be used, and how this can be concretized using the method. A more detailed, quantified walkthrough of this concretization can be found in http://tiny.cc/PRO-VE.

The BMP determines that, to concretize its listed costs and benefits, it needs information on the bike usages per month (to concretize operational costs) and requires negotiation with the BSSP to set the maintenance fee (which depends on both parties) (Step1). For Step 2, the business network first collaboratively determines the expected number of bike usages (as a public parameter), whereas consequently the BMP negotiates a preliminary value for the *maintenance fee* with the BSSP (expressed through a restricted parameter) (Step 3). Next, the BMP concretizes the operational costs per Step 4 (using a private parameter related to the operational costs per customer and the public parameter related to the expected number of customers)

current balance of costs and benefits. On the basis of the resulting profit balance (Step 5), both the BMP and BSSP seek after settings for the restricted parameter that result in an acceptable scenario for themselves (Step 6). This what-if analysis is private and not visible to others in the network. Based on the set of acceptable settings, the BMP and BSSP come together and negotiate on the final value of the restricted parameter (Step 7). If agreement is reached, the cost / benefit item *maintenance fee* accordingly can be concretized using the agreed upon parameter setting (Step 8). If both parties fail to reach an agreement, the network should come together and consider how the business model design should be altered (Step 9). Once all restricted parameters are concretized and agreed upon, the concretization process can be finalized (Step 10).

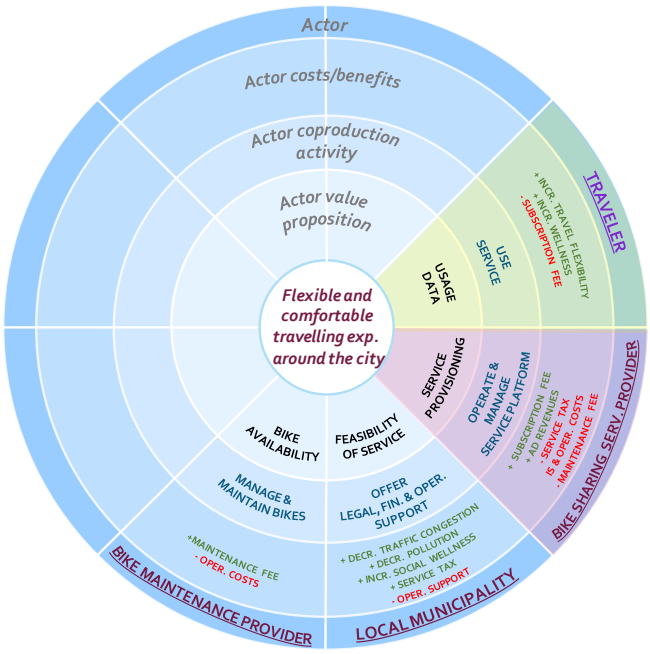

Fig. 2. Service-dominant business model design for bike sharing

5 Conclusion and Future Work

In this paper, we have proposed a method to guide the concretization of costs and benefits for service-dominant business models, taking into account the need for increased information governance with regards to how information is shared in business networks, which is especially relevant for competitive business settings. Through the illustrated process, actors in service-dominant business networks can concretize in a structured way the costs and benefits they obtain through participation in the business model in isolated, partially-shared and shared contexts. We identify

three design parameters based on knowledge or concern layers to aid this concretization. On the basis of this concretization, each actor consequently can judge whether the business model from their perspective is viable or acceptable, or explore under what parameter settings a viable or acceptable scenario is reached. These insights consequently can be used to support negotiation between actors.

As next steps to our method, we aim to support our method through (automated) tooling to facilitate its use, and to evaluate the usability and usefulness of the method.

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