A method for evaluating service-dominant business models in a corporate setting

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A method for evaluating service-dominant business models in a corporate setting

THESIS

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Preface

This master thesis is written as partial complement of the master Operations Management and Logistics at Eindhoven University of Technology. The aim of this thesis was to develop a structured method for financial viability evaluation of service-dominant business models in a corporate setting. I would like to take the opportunity to thank the people contributing directly or indirectly to my graduation.

First of all, I would like to thank Dr. O. Turetken and Dr. R. Gilsing of Eindhoven University of Technology. I would like to thank them for their support and guidance throughout my research. In these extraordinary times, I could always fall back on them with my questions and struggles.

I also would like to thank Jan Windey, who in the first place gave me the opportunity to explore an amazing organization. I very much appreciate that Jan had a lot of time to teach me interesting business insights. As Jan told me, graduating is not the end, it is just the beginning of my career. Moreover, I would like to thank my other colleagues participating in my research. Without them, this thesis would not have been the same.

Finally, I would like to thank my family and friends. Their support during my research is very much appreciated, I had some amazing years with all of you in Eindhoven. Lastly, a special thanks to my mom and dad, who enabled me to study and live in Eindhoven. I do not emphasize this often, but I hope you both know I very much appreciate it.

Thank you all for this amazing journey.

Thijs Canjels
Abstract

Context - Due to changing customer desires, organizations are shifting from goods-dominant logic towards service-dominant logic. The shift of organizations towards service-dominant logic resulted in the need for new business models, focusing on service dominant business model thinking. However, the evaluation of service-dominant business models is challenging. Therefore, a well-structured method is required. Currently, there is no method which systematically supports the financial evaluation of service-dominant business models in a corporate setting.

Objective - The aim of this thesis is to develop a method supporting the financial viability evaluation of service-dominant business models in a corporate setting. The method aims to give organizations a structured process such that organizations can decide upon the viability of the given service-dominant business model blueprint.

Method - We applied the design science research (DSR) methodology to develop a method regarding financial evaluation of service-dominant business models in a corporate organization. Based on an extensive literature review, the first version of our method was made. From existing literature an already existing method was found, which only focused on collaboration between organization. However, this method did not consider the underlying business units of the corporate organizations, which resulted in a need for an extended version. The first version of our method was refined through focus group with academic and industry experts. The final version of our method was applied to a real-life case scenario at the case company to evaluate the method’s utility and validity.

Results - The input of our method is a service-dominant business model blueprint, derived by applying an adapted version of the service-dominant business model radar. The first step of our method guides the user through the process of deriving a value capture diagram from the service-dominant business model blueprint, explaining how costs and benefits are exchanged through the network. Secondly, the value capture diagram is concretized, such that the user is able to negotiate on the acceptance of the proposed business model. Based on this structure and the demonstration at the case company our method is validated to be a useful method to financially evaluate the viability of a service-dominant business model in a corporate setting.

Contribution - We contribute to academic literature by proposing an empirically validated method, which provides support in financially evaluating service-dominant business models in a corporate setting. Moreover, our method has direct practical relevance, because it can be used by corporate organizations during the development of new service-dominant business models.
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Chapter 1

Introduction

Before the 1950’s goods-dominant (GD) logic described units of output as the central components of exchange (Lusch et al., 2007). In the 20th century organizations applying GD logic began to change with the emergence of a new way of marketing. According to Ronald (1990) before 1960 marketing was seen as transferring ownership of goods and their physical distribution. This raised the discussions if marketing was adding value to goods. Even after marketing was embedded in GD logic after the 1960’s, the consumer, competition and most other market variables remained focused on value creation (Barksdale, 1971). Still, the core business logic of these organizations remained centred to sell products rather than offer services. A major disadvantage of such GD logic is that organizations have limited impact in value creation of the customer (Vargo & Lusch, 2004).

Today, markets have become digitally connected across the globe. As competition increased immensely, organizations are forced to find new opportunities to create customer value (Oliva & Kallenberg, 2003). Moreover, customers increasingly demand customized, coherent and integrated solutions that satisfy daily needs (Kowalkowski et al., 2017). Consequently, organizations increasingly offer services rather than goods as their core business value, either to satisfy customer needs or to establish long-term relations with customers (Greer et al., 2016). Within research, the logic of delivering a service rather than goods is referred to as service dominant logic (SDL) (Vargo & Lusch, 2004).

In service-dominant business the core purpose is value creation for the customer. For SDL this value is created by exchanging services within a network of organizations (Vargo & Lusch, 2004). According to Vargo et al. (2008), networks must consist out of multiple parties for value creation in service-dominant business. By collaborating in these networks additional value is co-created by the organizations for the customer. However, not only in networks of multiple organizations, but also between business units in corporate organizations collaborations could take place. Eisenhardt (2001) stated that the phenomenon of multibusiness organizations has considerable importance in both practice and literature. From a theoretical perspective is suggested that multibusiness organizations are utilized for several reasons such as, better decision making (Chandler, 1991) and enhanced value creation through cross-business unit collaboration (Helfat & Eisenhardt, 2004). Additionally, according to Vizjak (1994) exploiting the synergy potential of collaboration between business units creates additional customer value. Furthermore, Bowman and Helfat (2001) noted that cross-business unit collaboration
can be a significant source of economic value for both the business unit as their over coupling corporate organization. However, some difficulties arise when business units within an organization have to collaborate (Auffrey, 2007). For example, who contributes what to the service or product delivery? According to (Auffrey, 2007) business units have their own goals and objectives resulting in debates regarding contribution, cross-charges and transfer prices that can slow down the collaboration. These difficulties suggest that each business unit within a corporate organizations act as a organization itself. The actor-to-actor resources exchange within collaboration networks are called service systems (Böhmann et al., 2014). Typically, the resource exchanges of service systems are conceptualized in business models.

The shift of organizations towards SDL resulted in the need for new business models, focusing on service dominant business model thinking. Currently, more business model design tools are created addressing the need for networked organization and co-creation of value (Turetken et al., 2019). Examples of these business models design tools are the service business model canvas (SBMC) (Zolnowski et al., 2014) and the service dominant business model radar (SDBM/R) (Lüftenegger, 2014; Turetken & Grefen, 2017). However, before service-dominant business model design tools can be used in practice, model evaluation is important.

Lai et al. (2006) stated that business models largely explain the performance level of an organization. This suggest that standardization of business model evaluation could create much value for an organization. Moreover, according to Krumeich et al. (2012) financial evaluation of business models is important; addressing costs and benefits per actor, investment costs, payback period and return on investment. However, still little is found in research about evaluating service dominant business models financially. Moreover, Turetken et al. (2019) proposed for future work to concentrate on development of evaluation methods regarding service dominant business models.

1.1 Problem Definition and Research Goal

In literature, for example Gilsing (2020) and Gilsing, Turetken, Ozkan, Slaats, et al. (2020) already proposed a method for financially evaluating service dominant business models. However, within these methods for financial service-dominant business models evaluation, mainly networks of organizations are considered. Nevertheless, value could also be created when business units within a corporate organization work together (Bowman & Helfat, 2001). As Auffrey (2007) mentioned, several different problems arise when business units instead of organizations start collaborating. Corporate organizations are normally build out of many business units all with their own objectives and goals, and therefore act upon different targets. Example given, one problem that arises when business units work together is that their services/products have different margins, when selling the complete service to the customer margins for one business unit could decrease while other margins increase. The different margins could lead to a profitable deal for the corporate organization, but business units could not gain enough for their specific targets, which leads to misunderstandings. Earlier, when goods-dominant logic was applied this was no problem. However, today corporate organizations are shifting from goods-dominant logic to service dominant logic as well, resulting in the requirement that business units work together to create customer value. This gives corporate organizations the opportunity to leverage the collaborations between business units and
achieve extra economic value, while collaborating with other organizations. To enable this, a new structured method is required to overcome the difficulties of business unit collaboration.

Considering the shift in corporate organizations to service-dominant business models, standardized ways of financial evaluation have to be expanded to this context. Therefore the problem statement of this thesis is formulated as follows:

*A lack of support is present in structurally financially evaluating service-dominant business models in a corporate setting.***

### 1.2 Research objective

To address this problem, the literature regarding financial viability evaluation of service-dominant business models must be used. Although there is yet little known regarding this topic, some methods can be found. However, these methods have all the assumption that the network should consist out of several organizations in order to create value, while the same problems arise within business units of corporate organizations. Concluding, this thesis addresses the following research goal:

*To develop a method supporting the financial evaluation of service-dominant business models in a corporate setting.*

### 1.3 Research design

To structure the research, the design science methodology of Peffers et al. (2006) is used. This method is widely used for conducting design science research in information system literature. As described, first relevant literature regarding service-dominant business models and their financial evaluation were identified. The relevant literature is the input of the proposed method for evaluating the financial viability of service-dominant business models in corporate organizations. However, changing the setting uncovered some differences in the assumptions made in existing literature. Using a case study and expert opinion, these differences are addressed. This resulted in the first version of the proposed method. Thereafter, the method was refined by conducting focus groups with industry experts. To evaluate the refined method, it was applied to a case study of the case company to evaluate its validity. The final version of our method has been evaluated for its utility by interviewing industry experts.

### 1.4 Thesis structure

This chapter aimed to give an introduction to the overall topic of this thesis. In the next chapter a structured literature review is conducted on service-dominant business models and their evaluation methods. The research process is discussed in Chapter 3. Chapter 4 gives an overview of the proposed method. Thereafter, a demonstration of the method is summarized in chapter 5. Consequently, the method is evaluated based on the finding in the demonstration in chapter 6. Finally, the conclusions are elaborated in chapter 7.
Chapter 2

Background and related literature

In this chapter a structured literature review will be conducted. First Service-dominant logic will be discussed by addressing the changes of the last years in industry. Thereafter, business models will be discussed and several business model designs will be given. Both goods-dominant and service-dominant business models will be discussed here. Then, the evaluation methods of service-dominant business models will be addressed, focusing primarily on financial evaluation. Also, financial evaluation methods and revenue models will be discussed. The chapter will be closed with a conclusion and discussion of the complete literature review.

2.1 Service-dominant logic

In business, a shift from industrial to service operations has taken place over the past decades (Yan et al., 2010). In literature the traditional goods-dominant logic, delivering products instead of a service to the customer (Lusch et al., 2007), also needed to be changed to match the shift in businesses. The service-dominant logic has been developed as a new mindset for doing business (Vargo & Lusch, 2016). Vargo and Lusch (2017) stated that service exchange has a central role considering the improvement of individual and collective well being in service-dominant logic. Therefore, economic exchange is focused on specialized skills and knowledge rather than goods.

In service-dominant logic the perception of value creation has changed as opposed to goods-dominant logic. In goods-dominant logic value is mostly considered as operand resources (often tangible, static, and finite resources that require action to make them valuable, e.g., raw materials) (Yan et al., 2010). However in service-dominant logic value is mostly considered as operant resources (often intangible, dynamic, and infinite resources that are capable of creating value, e.g., core competences or organizational processes) (Vargo & Lusch, 2004). Moreover, value is normally not created by one actor, value is seen as co-created by several activities of multiple actors, aware or unaware of each other (Böhmann et al., 2014).

The main assumptions underlying service-dominant logic are captured in the five core axioms of service-dominant logic identified by Vargo and Lusch (2016). These axioms are described in table 2.1 and thereafter further elaborated in this section.
CHAPTER 2. BACKGROUND AND RELATED LITERATURE

<table>
<thead>
<tr>
<th>Axiom</th>
<th>Description</th>
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<td>Axiom 1</td>
<td>Service is the fundamental basis of exchange</td>
</tr>
<tr>
<td>Axiom 2</td>
<td>Value is co-created by multiple actors, always including the beneficiary</td>
</tr>
<tr>
<td>Axiom 3</td>
<td>All social and economic actors are resource integrators</td>
</tr>
<tr>
<td>Axiom 4</td>
<td>Value is always uniquely and phenomenologically determined by the beneficiary</td>
</tr>
<tr>
<td>Axiom 5</td>
<td>Value co-creation is coordinated through actor generated institutions and institutional arrangements</td>
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Table 2.1: Five axioms of service-dominant logic by Vargo and Lusch (2016)

The first axiom states that service is the fundamental basis of exchange, with operant resources, as knowledge and skills, as this fundamental basis (Yan et al., 2010). In this logic, goods are seen as appliances for service provision. Moreover, money is normally involved in economic exchanges, while within service-dominant logic money is seen as a right for future service.

During the goods-dominant logic era, the production firm was seen as value creator. However, during the service-dominant logic era value is created by multiple actors. In detail, the second axiom suggests that value is co-created through interactions between actors, direct or indirect through goods (Suratno, 2020). Therefore, value comes from the use of multiple service offerings together with resources provided by other actors.

As explained, required resources throughout the network of actors can come from different sources and together the network of actors co-create value. This value is co-created by the integration of required resources, which result in all social and economic actors as resource integrators, which is the third axiom. Moreover, Vargo (2009) explains that the integration is not only directly available resources but also with indirectly provided resources by actors in other resource-integrating networks.

The fourth axiom suggest that value for all different actors must be determined only by the actors who benefits from the service exchange (Suratno, 2020). Moreover, all services are different, suggesting again that its value depends on the service use.

Lastly, the fifth axiom suggests that value co-creation is performed applying a set of rules, norms and believes. Accordingly, actors are enabled to keep expanding the exchanged services. Moreover, as stated in the axiom, value co-creation is coordinated through actor-generated institutions and institutional arrangements, suggesting self-governing and self-adjusting economic networks.
2.2 Business models

In this section the idea behind business models will be elaborated. Also, some business model definitions will be mentioned.

"Business modeling is the managerial equivalent of the scientific method you start with a hypothesis, which you then test in action and revise when necessary" (Magretta, 2002). Therefore, according to Magretta (2002), business models guide the process of creating value for customers. However, many different definitions for business models are given in literature. Some often returning concept within business models will be given in the coming paragraphs.

According to Chesbrough and Roosebloom (2007) business models offer value propositions for innovative ideas. In addition, business models create value for continuously arising new opportunities within businesses (Fiet & Patel, 2008). Moreover, Alt and Zimmermann (2001) state that your mission is elaborated in business models. In line with that, Al-Debei and Avison (2010) and Casadesus-Masanell and Ricart (2010) argue that business models have a central role in organizations, because they close the gap between decision making on strategic and operational level.

In addition to value creation, business models are often seen as revenue models (Alt & Zimmermann, 2001; Timmers, 2000). Today, revenue of business models is not only considered as financial wealth, but also social and environmental wealth (Bocken et al., 2014). However, this research focuses on financial based revenue, to understand if the new business model will gain revenue for the organization. Amit and Zott (2001) stated that business models describe how content structure and governance of transaction are determined in business, suggesting again that business models are somewhat revenue models.

Lastly, business models describe a value network considering the integration of partners and suppliers (Al-Debei & Avison, 2010). This means that a business model does not only describe the resources, capabilities and competencies needed from the organization but also from the network.

Considering all concepts of a business model, a summarise is given below:

- A business model reflects on the logic of how value is created and captured
- A business model contains a revenue model considering all transactions
- A business model relates on a mission the organization pursues
- A business model described the resources and capabilities needed from both the organization and the partners and suppliers.
2.3 Business model designs

In this section several business model designs will be discussed. First, the widely used and known Business Model Canvas will be discussed, following with several service-dominant business model design tools. Furthermore, the proposed service-dominant business model design tools will be evaluated and one design will be chosen for the research.

Business Model Canvas

The Business Model Canvas (BMC) of Osterwalder and Pigneur (2010) is a framework for the design of new business models. This framework is focused on brainstorming and staff inspiration and is widely used in industry. The framework captures nine essential parts of a business model, which are shown in 2.1. According to Osterwalder and Pigneur (2010), a business model is a dynamic system, not a collection of independent parts, so a change to one element is likely to have an impact on one or more of the others, meaning that many iterations could be performed by designing the new business model. The goal is to maximize broader strategic thinking while minimizing going into operational details.

Figure 2.1: Business Model Canvas (Osterwalder & Pigneur, 2010)
2.3.1 Service-dominant business model designs

While the shift from goods-dominant logic to service-dominant logic evolved, new business models had to be created to serve this shift. Kindström (2010) analyzed the implication of the mentioned shift for business model conceptualization. A major implication is that value is no longer created for the customer but in collaboration with the customer. Moreover, value is also created in collaboration with a network, resulting in service-dominant business models which are not only for a single organization but feature a network of organization creating value with the customer. This also has implications for the revenue models considered by the network, which should be based on the exchanges between all actors in the network. Turetken et al. (2019) defined a service-dominant business model as: "a representation of the way in which a network of organizations, including the providers and customer, co-creates a value for the customer through a solution-oriented service and generates revenue and benefits for all network partners".

Service Business Model Canvas

Using service-dominant logic, Zolnowski et al. (2014) proposed a service-oriented business model canvas, called the Service Business Model Canvas (SBMC). The model is shown in figure 2.2, service is explicitly chosen as basis for the model. Moreover, in contrast with the business model canvas, the partner and customer perspective are added to the model as well. This results in the possibility to relate the building blocks to other actors in the business model design, enabling clarification of value co-creation. Lastly, the partner perspective can be used several times to account for the complete networked organization of the service.

Figure 2.2: Service Business Model Canvas (Zolnowski et al., 2014)

Figure 2.2 contains out of seven aspects, these seven aspects are shortly elaborated upon below:

1. The cost structure represents the costs each actor has when contributing in the business model.
2. The key resources describe the resources each actor contributes to the business model.
3. The key activities describe the activities each actor contributes to the business model.
4. The value proposition describes the value obtained by each actor contributing in the business model.
5. The relationship describes the contribution of each actor in maintaining the relationship between the actors.
6. The channels describe the place each actor contributes to enable conversations between actors.
7. The revenue streams indicate the financial revenue captured by each actor.

Service Logic Business Model Canvas

Ojasalo and Ojasalo (2018) proposed the Service Logic Business Model Canvas (SLBMC), shown in figure 2.3. Also, as the SBMC, the SLBMC considers the service-oriented thinking to propose a new variant of the well-known BMC. Moreover, the SLBMC focuses on the SDL principles, discussed in section 2.1. Moreover, the SLBMC does not consider the networked view of the organization, it rather focuses on co-creation of value through the building blocks for the focal organization. This approach results in a framework which relates each building block to either the network and the customer. The figure below contains an explanation of each building block.

![Service Logic Business Model Canvas](image-url)

Figure 2.3: Service Logic Business Model Canvas (Ojasalo & Ojasalo, 2018)
Service Dominant Business Model Radar

Grefen et al. (2013) and Turetken et al. (2019) use the SDL thinking to create their Service-Dominant Business Model Radar (SDBM/R). As can be seen in figure 2.4, they propose a circular template for representing service-dominant business models. This enables the view of a collaboration network which co-create value with and for the customer. Consequently, for each actor in the network, the user can define their value proposition, co-production activity and their cost and benefits. All together, the co-created value in use can be defined. An example is given by Gilsing et al. (2018), which proposed a reference model for the design of service-dominant business models in the smart mobility domain.

Figure 2.4: Service Dominant Business Model Radar (Turetken et al., 2019)

The SDBM/R represents for a specific customer segment the value of a solution at the center of the radar, called the co-created value-in-use. The value-in-use is composed of the service based value propositions of all actors participating in the business model, including the customer. The value-in-use, is build up out of four rings, highlighting how the value-in-use is co-created through the network. Moreover, each ring is divided in multiple slices, representing all different stakeholders/actors in the business model design. In figure 2.4 four supporting actors are described, however, this can be changed to any number of participating actors. The four mentioned rings will be further discussed below:

1. *Actor value proposition* ring indicates the value contribution of all actors to the co-created value-in-use.

2. *Actor co-production activity* ring elaborates on activities actors need to perform to create their value proposition. The co-creation interactions are the strategic elements for knowledge sharing and service integration and flows.

3. *Actor cost/benefit* ring represents the financial and non-financial costs and benefits of all participating actors in the network.
4. *Co-creation actors* ring is the outer ring of the proposed framework, considering the Focal Organization, the partners and the customer. The Focal Organization proposes the business model and has a large contribution to the value-in-use. The Core Partner is defined as a partner which participates actively in the solution core, whereas an Enriching Partner participates in enriching the solution (Turetken & Grefen, 2017).

**Comparison of service-dominant business model designs**

An important aspect of service-dominant business models is the co-creation of value through a networked organization. In the models considered in this section, the SDBM/R performs best in showing the networked perspective, where the co-created value is in the middle. However, while the SLBMC does not consider the networked organization, SBMC does moderately considers the value creation of the network.

Secondly, capabilities and resources of actors in the networked organization are important. The SBMC considers all capabilities and resources of all actors in the framework. Considering SLBMC, it only shows the capabilities and resources of the focal organization and not of the complete network. In the SDBM/R only the actors co-production activity is stated and therefore not all capabilities and resources are normally shown.

Lastly, financial value and exchange are important for a business model of a networked organization. SDBM/R considers for all actors the costs and benefits when participating to the service network. However, in the SBMC it is not explicitly stated what the financial values are for the considered actors in the network. Moreover, SLBMC again only considers the focal organization and therefore does not explicitly show the financial values for all actors in the network.

Concluding, considering the above mentioned criteria, the SDBM/R is the best model. This model proposes a complete network view of all actors including the customer with their value proposition. Therefore, the SDBM/R will be used as the service-dominant business model design in this research.

### 2.4 Business model evaluation

In this section a financial evaluation method for service-dominant business models will be discussed. Little financial methods could be found in literature, however Gordijn and Akkermans (2001) proposed the e3-value model and recently Gilsing (2020) proposed a method for evaluating a service-dominant business model. These methods will be discussed in detail in this section.

#### 2.4.1 e3-value model

Gordijn and Akkermans (2001) proposed the e3-value model, originating from the e-business domain. The notation and a simple example are given in figure 2.5. The e3-value model helps to define economic value for the customer through a collaboration of different actors (Gordijn,
The exchange of economic value is the basis of exchange between the actors in the model. The e³-value model facilitates the modeling of value networks between organizations and customers collaboration in a network.

A more complete example is given in figure 2.6. In this example the final customer is the reader of the newspaper, several actors involved in the service process. All transactions with the customer are shown in the example.

The e³-value model helps mapping the transactions between the actors and the customer, however it does not map transaction between other actors. Moreover, the costs of all actors are also not provided in the model, this makes it impossible to calculate financial viability for the different actors in network.
2.4.2 INEM - Integration evaluation method

In figure 2.7 a framework for the INEM method can be found. As can be seen in the white squares, the method consists out of 2 steps. First, the value model will be derived from the proposed SDBM design. Thereafter, the value model will be concretized and analyzed, resulting in an accepted or declined SDBM design.

![Figure 2.7: INEM method overview (Gilsing, 2020)](image)

**Step 1 - Elicit value capture diagram**

The goal of INEM’s first step is to map the value model behind the SDBM design. This enables the user to understand costs and benefits are exchanged through the network. For simplicity Gilsing (2020) considers only contractual value exchanges. In figure 2.8 the notation for the value capture model is shown. The value capture model considers all actors in the SDBM design and their value exchanges. After the figure, the four creation steps of the first step will be stated.

![Figure 2.8: Notation value capture diagrams (Gilsing, 2020)](image)

To create the value capture diagram, several design steps have to be followed:

1. **Map each actor participating in the SDBM design to the value capture diagram**
2. **Map the exchange of financial costs and benefits between actors**
3. **Map the non-financial value exchanges between actors**
4. **Complete the value capture diagram**
Step 2 - concretize and analyse value model

The model created in step 1 will be taken as input for step 2 of INEM. The goal of step 2 is to concretize and analyse the value model, to assess the viability of the SDBM. To do so, this step creates a structured process supporting the financial value exchange in collaborative business networks, considering knowledge exchange. Step 2 is the last step before going to the implementation fase of the SDBM design.

![Figure 2.9: Levels of concern for network (Gilsing, 2020)](image)

Within the method, there are three levels of concern considering the knowledge exchange. The levels are shown in figure 2.9. The levels will be shortly discussed below:

- **Public level parameters**, affect all actors in the SDBM. These parameters are defined together with all actors in the network.

- **Restricted level parameters**, affect only a subset of the actors in the SDBM. Accordingly, only the affected actors in the network define the parameter together.

- **Private level parameters**, affect only one actor and are therefore also defined by that actor.

In figure 2.10 the process model for INEM is shown. The model language used is BPMN. The lanes represented the levels of concern with their parameters, shown in figure 2.9. A summary of the process model is given below.
In summary, the model defines all parameters on the defined levels of concern. Thereafter, values for all parameters will be determined by the required actors. Finally, and after most steps, an iteration is possible the re-define the parameter. At the end can be chosen if the value model is accepted or rejected. This method works when several organizations collaborate in a network, however when considering also the business units within an organization this method lacks the possibility to address those as well. This is important because business units have their own goals and objectives which should be accommodated to as well. For a new method we need to enable the corporate organization to split its organization into business units collaborating with other organizations in the network and financially evaluate the SDBM blueprint accordingly.
2.5 Financial evaluation measures

In this last section we will elaborate on widely used financial evaluation measures. These measures will be used in the proposed financial evaluation model in this thesis.

Return on investment

Return on Investment (ROI) is a performance measure used to evaluate the efficiency of an investment or compare the efficiency of a number of different investments (Stapleton et al., 2014). ROI tries to directly measure the amount of return on a particular investment, relative to the investment’s cost. To calculate ROI, the benefit (or return) of an investment is divided by the cost of the investment. The result is expressed as a percentage or a ratio. ROI has potential issues arising with investments in different time frames, this will be taken into account. The formula for ROI is:

\[ \text{ROI} = \frac{\text{NetIncome}}{\text{Investment}} \]  

Payback period

The payback period refers to the amount of time it takes to recover the cost of an investment (Stapleton et al., 2014). Therefore, the payback period is the length of time an investment reaches a break-even point. However, one limitation should be taken into account for the payback period; the payback period ignores the time value of money (TVM)—the idea that money today is worth more than the same amount in the future because of the present money’s earning potential (Stapleton et al., 2014). The formula for the payback period is:

\[ \text{Payback period} = \frac{\text{Initialinvestment}}{\text{NetCashFlowperPeriod}} \]  

Net present value

Net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows over a period of time (Stapleton et al., 2014). NPV is used in capital budgeting and investment planning to analyze the profitability of a projected investment or project. An estimation of the investment’s profitability using NPV relies on the assumptions and estimations of variables, therefore it could have some error (Stapleton et al., 2014). Estimated factors include investment costs, discount rate, and projected returns. A project may often require unforeseen expenditures to get off the ground or may require additional expenditures at the project’s end. The formula for NPV is:

\[ \text{NPV} = \sum_{t=1}^{n} \frac{R_t}{(1 + i)^t} \]
While NPV is a well-known financial evaluation measure, it does have a disadvantage, namely it is known to ignore risk (Brookfield, 1995). Two of the three factors in the NPV formula are dependent on the riskiness of the project. First, the future cash flows can turn out to be lower than the estimated values. Moreover, the discount rate could be wrongly calculated, which is crucial in the calculation of the NPV. If one of these factors is wrongly estimated, it can result in a NPV value significantly deviating from the initially calculated value. According to Almeida and Philippon (2007), adjusting the NPV formula on possible risks, can give great results for finance. Concluding, when evaluating new service-dominant business models, there should be accounted for the risk ignorance of the NPV.

2.6 Financial payment methods

When calculating the financial measures of the previous section, some other important factors must be considered. One important issue is if the customer buys or leases the service provided by the corporate organization. Another important aspect for the corporate organization is if the deal is on the balance sheet or not. This section explains the various different payment methods described above.

2.6.1 Buy versus lease

In practice many different lease construction exist, but in all cases the lessee (user) promises to pay a serie of payments to the lessor (owner) (Stapleton et al., 2014). In the contract is specified how often the payment is being made, starting when the contract is signed. Moreover, also the residual value of product is decided beforehand and specified in the contract (Stapleton et al., 2014). Buying and selling is obvious, in that case the buyer pays an amount of money to receive the good or service to the organization. Below are several reasons listed why someone should lease according to Stapleton et al. (2014):

- Maintenance is provided: In a full-service lease the users receives maintenance and other services. Possibly, the lessor will be well equipped to do effective and efficient maintenance.
- Tax shields can be used: In several countries across the world tax shields are in place for leasing constructions. This could be interesting for your financial situation.
- Leasing avoids capital expenditures: When a company does not have enough money to buy the service or product, they could lease it. Leasing will normally be an operational expenditure instead of a capital expenditure, resulting in several accounting advantages.
- Cancellation options are valuable: Sometimes in the contract is specified that the lessee can stop the agreement at any time. Being able to cancel the agreement gives some obvious advantages.
If you need a product or service for a long time, you should maybe buy it if that is possible. However, if you only need it for a short period, leasing could be interesting as well. In other words, leasing or buying is a grey area and should be evaluated each time (Stapleton et al., 2014).

The above mentioned reasons for leasing are from the view point of the lessee, however from a lessor its view point some different trade offs have to be made. When a product is leased from the lessor, the product is on the balance sheet of the organization, resulting in a fixed-asset for the organization as long as the contract goes. An organization with high fixed costs, relative to variable costs, is said to have high operating leverage (Stapleton et al., 2014). According to Stapleton et al. (2014), a high operating leverage brings high risks with it. Organizations with high operating leverage for long-term projects are highly influenced by shifts in the discount rate, which will change the NPV immensely (Stapleton et al., 2014). As explained in the previous chapter, changes in the discount rate highly influence the NPV of a project, resulting in either high gains or big losses. Therefore, these changes result in high risks for organizations if their operating leverage is too high. This should be taken into account when evaluating new service-dominant business models in corporate organizations.

There is one additional method available for a leasing construction. Third party financing institutions can be used for the financial structure. The corporate organization sells the product or service to the third party, which leases it to the customer (Stapleton et al., 2014). This helps the corporate organization to decline their risks in such deals and helps the customer to still do leasing. For a third party financial institute, the risk normally can be divided over a wider portfolio which makes it less dangerous (Stapleton et al., 2014).

2.7 Revenue models

In this section revenue models will be discussed. Changing from goods-dominant logic to service-dominant logic brings another approach for gaining profit as well. DaSilva and Trkman (2014) defined revenue models as: "the specific mode in which a business model enables the generation of revenue, a revenue model describes the revenue sources, their volume and distribution". The past years, several researches have investigated the shift in revenue models. Ng (2010) found four major movements of impact on future pricing and revenue models, these are discussed below:

- Value is co-created with the customer, which influences the pricing strategy.
- Future service value reside within a complex service system with multiple participating actors, resulting in revenue models incorporating system thinking.
- Future payments will be payments for rights, instead of exchanging ownership (goods-dominant logic).
- Understanding of the context of use and the way services and goods are used in combination within the context would lead to new mechanisms for pricing, bundling and new revenue opportunities.
As pricing highly influences the profitability of a business model, it is an important aspect. As there are many different pricing strategies, researchers often categorize them in three groups (Hinterhuber, 2008).

1. Cost-based pricing
2. Competition-based pricing
3. Customer value-based pricing

Of these, customer value-based pricing is increasingly recognised in the literature as superior to all other pricing strategies (Ingenbleek et al., 2003; Töytäri et al., 2015). For SDBM, creating service networks including the customer, these pricing models are considered as well. Two examples of customer value-based pricing are pay per use and value-based pricing, these are discussed below.

**Pay per use**

One proposed revenue model by several researchers is called pay per use. Helander and Möller (2007) defines pay per use as services that allow customers to pay only for its usage, so that they benefit from using and accessing the product without having to purchase it. It is important to understand what is needed for an organization to effectively implement a pay per use revenue model. Gebauer et al. (2017) proposed framework for pay per use capabilities and competencies, this framework is shown in figure 2.11. A small discussion of the framework will be given below.

![Figure 2.11: Framework Pay per use (Gebauer et al., 2017)](image-url)
In the framework of Gebauer et al. (2017), three core competencies can be found:

- **Strategizing pay per use services**: integrating partners and customers in the pay per use services, success of the pay per use approach is highly influenced by other actors in the value network.

- **Utilizing technologies for pay per use services**: use software as guidance for pay per use services and monitoring the usage across the entire network.

- **De-risking pay per use services**: become specialized in managing the risks of a pay per use deal. One often used example to de-risk a deal is a basic price which have to be paid at least every month.

The three core competencies are built up out of several capabilities from three main organizational capabilities; financing pay per use services, aligning costs with equipment usage and collaborating with the customer. The three main capabilities are decomposed into the capabilities shown in the square of figure 2.11. All together, this leads to differentiation and cost advantages.

**Value-based pricing**

Another highly promising revenue model when considering SDBM is value-based pricing. According to Hinterhuber (2008), value-based pricing uses the co-created value of a delivered product or service as the main factor of setting prices. Using this approach, several different prices can be determined for different value proposition, but also for different quantity of sales. To understand and implement value-based pricing Hinterhuber (2004) proposed a framework, which is shown in figure 2.12. The framework will be shortly discussed after the figure.

![Figure 2.12: Framework Value-based pricing (Hinterhuber, 2004)](image-url)
CHAPTER 2. BACKGROUND AND RELATED LITERATURE

The proposed frame work of Hinterhuber (2004) consists out of four iterative phases. Each phase will be further elaborated below:

- **Define pricing objectives**: the objectives of pricing are directly related to the company its strategy. Pricing strategies of companies pursuing market penetration, which requires a different strategy than companies which want to maintain market share. Resulting in pricing objectives which vary between products and over time, and even between business units.

- **Analyze key elements of pricing decisions**: three main actors can be identified when analyzing key elements of pricing decisions, the company itself, the customer and the competition. For the company it is important to understand the customers’ value and against which price the competition can deliver the same value. These analyses help the company to make profitable pricing decision.

- **Select profitable price ranges**: within calculated product margins, companies can define and select profitable price ranges for their products and services, using the information gained regarding the customer and competition.

- **Implement price change**: when new pricing strategies are defined and accepted they must be implemented. Ideally, many people are involved in the change process, to fully embrace the new strategy. Moreover, rewards should sometimes be changed to profit based instead of sales based (Hinterhuber, 2004). Lastly, customer involvement is important to stay ahead of the competition.

2.8 Literature conclusion

As this research focuses on developing a method support financial evaluation of SDBM in a corporate setting, with existing literature as main input, an extensive literature research has been conducted. In this literature conclusion the main findings are discussed and reflect upon.

Several researchers already pointed out to the shift from goods-dominant logic to service dominant logic (Yan et al., 2010). Vargo and Lusch (2016) described five axioms representing the core underlying assumptions of service dominant logic. These axioms, contain that service is co-created by the complete network, including the customer, in a coordinated process. This is the basis for newly developed service-dominant business models.

To describe all proposed business models, first a definition was defined. In summary, a business model reflects on value creation pursued by the organization’s mission. Moreover, it contains the revenue model together with the resources and capabilities needed to perform the business. According to Turetken et al. (2019) a service-dominant business model is: “a representation of the way in which a network of organizations, including the providers and customer, co-creates a value for the customer through a solution-oriented service and generates revenue and benefits for all network partners”.

A method for evaluating service-dominant business models in a corporate setting
Several service-dominant business model design tools have been described. The SBMC of Zolnowski et al. (2014) is based on the BMC, with the addition of the partner and customer perspective. The SLBMC of (Ojasalo & Ojasalo, 2018) is also based on the BMC, also adding the customer perspective in the model. However, the SLBMC focuses primarily on the focal organization and not on the complete network. Lastly the SDBM/R of Turetken et al. (2019) was proposed as a service-dominant business model design tool, the radar enables the view of co-creation of value for a collaboration network. As the SDBM/R performs best on both co-creation of value and financial value exchange between actors, the SDBM/R is chosen as the service dominant business model design tool for this research.

In literature not many financial evaluation methods for service-dominant business models can be found. One is the e3-value model of Gordijn and Akkermans (2001), which helps to define economic value for the customer through the collaboration with the different stakeholders. However, this model does not make explicit what the economic exchanges are between the actors and which costs they have in the collaboration. Moreover, the INEM method of Gilsing (2020) describes the evaluation process based on a network of organizations. This model does take into account the costs of the different organizations in the network, but it does not consider the different problems and opportunities arising with collaborations of business units in a corporate organizations. While we found that the shift of corporate organizations to service-dominant business models requires business units to work together to create more economic and customer value, this is not yet incorporated into the financial evaluations methods in literature. However, this research uses the INEM method as input.

As Ingenbleek et al. (2003) and Töytäri et al. (2015) stated, the new customer value-based pricing methods are superior to earlier methods. For service-dominant business models two relevant of these pricing methods are described: Pay per use and value-based pricing. In pay per use, the customer only pays when using the service, however, if the service is used intensively this could be more expensive. Value-based pricing considers the value addition of the service to the customer and decides a price upon these findings. To evaluate these revenue models three financial evaluation methods are found; Return on investment, Payback period and the Net present value. These will be used in the proposed method of this research.
Chapter 3

Research Design

To develop our proposed method, a design science research approach is applied. The idea behind design-science is to create new innovative artifacts to pursue extending the boundaries of human and organizational capabilities (Hevner et al., 2004). In design science research the primary focus is on the design and its proof of usefulness of a new innovative artifact (Peffers et al., 2006). Besides, in design science research generating theory to solve authentic problems is a major goal (Wang & Hannafin, 2005). Moreover, researchers usually take the initiative in the research process as both researcher and designer (Wang & Hannafin, 2005). Since the primary focus of this research is to design a method solving a authentic problem and the initiatives are with the researchers, following design science research works best. Several different methodologies have been developed for design science in the information systems literature. For this research the methodology proposed by Peffers et al. (2006) is chosen, which is shown in figure 3.1.

The research process followed in this research is shown in figure 3.1. During the problem identification and motivation phase, the context is based on problems arising at corporate organizations and an extensive literature review. The problem identification and motivation phase is the input for setting the requirements for the method of this research. These requirements serve as objectives for the design and development phase. First based on findings at
the case company and the extensive literature review an initial method will be created. This method, obviously, must hold all the requirements set in that phase. The first version of the method will be demonstrated to experts in the field, using their feedback the second version is build with its procedure. The second version of the method serves as final input for the demonstration and evaluation phase. In this phase, the method is applied to a case at the case company for calculating financial profitability of a service-dominant business model using several revenue models. The application can be seen as testing the validity of the proposed method, thereafter the utility of the method is tested by interviews with stakeholders at the case company. Finally, the method is communicated in practice and literature. A more in depth elaboration of the followed steps in this research is given below.

3.1 Problem Identification and Motivation

In this section the research problem will be identified and a justification of the added value of a new method will be given. According to Peffers et al. (2006) required resources to successfully perform this activity are; knowledge of the state of the problem and the importance of the problem’s solution. Therefore, information regarding service dominant business model evaluation was needed. This knowledge is stated broadly in Chapter 1 and in more detail in Chapter 2.

In summary, business models largely explain the performance level of an organization (Lai et al., 2006). When companies start to shift to new service-dominant business models, it is therefore important to evaluate these. Also, Turetken et al. (2019) stated that future research should concentrate on development of methods for evaluation of service-dominant business models. Besides, Krumeich et al. (2012) mentioned that the most important part of business model evaluation is finance. Lastly, we found a research gap in the financial evaluation of service-dominant business models in corporate organizations. Therefore, based on the gathered knowledge, the identified problem is; a lack of support in terms in terms of tools and methods for financial evaluation of service-dominant business models in corporate organizations.

3.2 Define the Requirements for a Solution

Based on the problem identification and motivation of the previous section, a main design requirement and several design sub-requirements have been formulated. During the design phase and the evaluation phase the main requirement and its sub-requirements are used to understand if the method addresses the right problem.

we found a research gap in the financial evaluation of service-dominant business models in corporate organizations. Accordingly, the main design requirement of this research is:

The method should support financial evaluation of service-dominant business models in a corporate setting.
The main design requirement consist of two parts. First, support of the financial evaluation process of new business models. Second, support of service-dominant business in corporate organizations, meaning the collaboration between multiple parties within the organization but also outside the organization. Resulting in several requirements for the proposed method.

To adhere to the first part of the main requirement, financial evaluation of the new business model should be supported. According to Morris et al. (2005), the revenue model underlying the business model usually serves as the continuation driver of the proposed new business model. In this thesis we refer to value model instead of revenue model. While analyzing the value model, it should become clear how each actor gains from the collaboration within the service-dominant business model in a corporate setting. The value model analysis should give an understanding of the viability of the proposed business model (Morris et al., 2005). This leads to the following requirement of the proposed method:

**R1:** The method should facilitate the corporate organization to quantitatively evaluate the value model of a service-dominant business model

Jaakkola and Hakanen (2013) found that there is limited evidence on how value is divided in collaborative networks. Moreover, we found that this was especially not present in a corporate setting. However, according to Vargo and Lusch (2017) value co-creation within a collaborative network will result in the exchange of costs and benefits, which should be divided. This will be also true for collaborations between business units in a corporate organization. Also, Auffrey (2007) found that sometimes even more problems arise in business unit collaborations. Therefore the proposed method should support the decision making between business units on how costs and benefits should be negotiated and concretized. This leads to the following requirement:

**R2:** The method should support the decision making process of business units to negotiate and concretize the revenue model of a service-dominant business model within a corporate organization

As the method builds upon evaluation of service-dominant business models, the method should be grounded on the axioms of service-dominant logic described by Vargo and Lusch (2016). This will ensure that the method will hold on the most important axioms of service-dominant logic as value co-creation and service exchange. This leads to the following requirement for the proposed method:

**R3:** The method steps should be grounded on the axioms of service-dominant logic

Finally, the method should be considered useful for corporate organizations in practice. Therefore, the method should be applicable by people which are not yet familiar with the proposed techniques. Otherwise, the actual use of the proposed method will be limited. This leads to the last requirement of the method:

**R4:** The method should be understandable and usable
3.3 Design and Development

The initial version of the method is developed by combining two perspectives and taking into account the requirements stated in section 3.2. The first perspective used, is the extensive literature review which can be read in chapter 2. Secondly, expert knowledge from relevant stakeholders belonging to the case company was used to adjust the methods found in literature to a corporate setting. Moreover, after the design and development of the initial version, the method was introduced to several experts in practice and research, which resulted in some minor changes. The roles of the relevant experts were business process model experts, solution leaders and business engineering researchers. The updated version was discussed and used for a case scenario at the case company. A summary of the complete method is given in chapter 4.

3.4 Demonstration and evaluation

The next step in design science research is to demonstrate the proposed method. Within this research the method is applied in a real-life case at the case company, which can be used to evaluate its utility and validity (Yin, 2011). At the case company a model is created to financially evaluate a real-life service-dominant business model scenario, containing several business units and other organisations. The case company was in the shift towards service-dominant business models, which made them relevant for our demonstration.

The evaluation phase evaluates how well the method is supporting a solution to the given problem (Peffers et al., 2006). To evaluate the validity of the method proposed in this research, the method was applied to a setting at the case company, as described in the demonstration phase. The aim here was to understand if the method leads to the desired results in the end. Secondly, to evaluate if the proposed method was understandable and usable several semi-structured interviews with stakeholders at the case company were conducted. The semi-structured interviews were based on the Technology Acceptance Model (TAM) of Davis et al. (1989). Based on the findings of both evaluation steps, improvement direction were indicated for the method. A summary of the method its demonstration and evaluation is given in chapter 5 and 6.

3.5 Communication

After the evaluation of the method, the results are shared with the case company. Further communication to other researchers and people in practice is via this report, which will be made public in collaboration with the TU/e.
Chapter 4

Method

4.1 Method overview

Our method describes a guiding process to find, concretize and analyse the value model behind the service-dominant business model in a corporate setting. The goal of the method is to support the actors in financial evaluation of a service-dominant business model. The acceptability is defined in terms of costs and benefits for the actors. The method is depicted in figure 4.1, thereafter a brief explanation will be given.

![Method overview diagram](image)

The input of our method is an adapted service-dominant business model radar, the explanation of the adaption is given in the next section. The first step of our method guides the user through the process of deriving a value capture diagram from the SDBM/R, explaining how costs and benefits are exchanged through the network. Thereafter, the value capture diagram will be concretized, such that the user is able to negotiate on the acceptance of the proposed business model. If the value capture diagram is accepted, it is ready to go for implementation. However, if the value capture diagram is not accepted, either the service-dominant business model should be changed or other alternatives have to be found.
4.2 Design input

4.2.1 Service-dominant business model radar

In a business setting, for each customer a SDBM blueprint is developed, each with multiple organizations collaborating in the network. Basically, in a corporate organization this same process holds. However, the service delivery is not only delivered by collaborating organizations, but also by collaborating business units inside the organization itself. To enable the possibility of creating such SDBM blueprint we use the SDBM/R. To enable the usage of the SDBM/R for creating the SDBM blueprint, some minor changes have to be done. First, we have to relax the assumption that the service is delivered by a network of organizations. Thereafter, we have to divide the process of creating a SDBM/R in several stages, which is shown in figure 4.2.

![Adapted service-dominant business model radar](image)

Figure 4.2: Adapted service-dominant business model radar

In the first stage of creating the SDBM/R the customer and the corporate organization must understand what value they can create together. The communication between the two organization is to be done by the "Communication Business Unit". After they defined the co-created value, the corporate organization starts incorporating the different necessary business units, this is stage two of the process. Within this stage, it is defined how the value created by the corporate organization as a whole could be divided over the business units. When the total value could be delivered through a collaboration between the customer and the corporate organization, no more actors are added to the SDBM/R. However, if some additional value is needed, which can not be delivered by any of the business units of the corporate organization, stage three starts. At this stage, extra organizations have to be found to deliver the required value.
To enable the user to use this thesis its method we will shortly describe how to use the service-dominant business model radar, as it is the input for our method.

**Procedure to develop a SDBM radar:**

1. Identify the co-created value-in-use and targeted customer. It is important at this stage that the co-created value-in-use is created together with its targeted customer.

2. Describe the intended customer experience. The customer experience description gives a high level overview of the intended business model.

3. Determine value-in-use components of actors and relevant actors for business model. At this point we must ensure that we only consider the core partners in the service-dominant business model to not over complicate it.

4. Determine costs and benefits of all actors. The relevant costs and benefits can be both financial and non-financial. When evaluating the service-dominant business model design the sum of all costs and benefits should be positive to have a valid design from a global perspective and for all contributing actors separately.

5. Determine for each actor the high level activities to realize the actor-value proposition. The determined activities are part of the customer experience and will possibly be part of the business model that will be executed by the actors from the network.

Despite the sequential steps for the development procedure of a service-dominant business model radar, the development procedure is an iterative process. Therefore, changes in any of the steps can be made at any moment in time. The final outcome of this practice is a service-dominant business model blueprint together with the customer journey, which will be the input of this thesis its method.

**4.3 Method step 1 - Value Capture Diagram**

In the first step of our method we consider the costs and benefits stated in the SDBM blueprint, which is the input for this step. This step helps the user to understand how the costs and benefits are exchanged throughout the entire business model design. Also, the costs and benefits exchanged in the corporate organization are mapped within the organization.

To enable creating the value capture diagram, we adopt the value network analysis (VNA) approach, which is proposed by Allee (2008). This approach enables the exploration and mapping of value exchanges between the actors of the SDBM blueprint. Within the approach, the exchanged objects can be categorized into tangible (e.g. financial resources) and intangible (e.g. tacit knowledge) objects. Moreover, a distinction is made between contractual and non-contractual exchanges. A contractual exchange can be either tangible or non-tangible, however a non-contractual exchange is always considered to be intangible.
Within this research only contractual exchanges will be considered, reasoning that the focus of this research is on financial evaluation, which is by definition a contractual exchange. While financial terms are only considered as tangible objects, also intangible objects, as social or environmental change, could indirectly lead to financial costs or benefits. For our method, if these intangible objects are contractually captured or within an organization, they are mapped into the value capture diagram. Moreover, for all actors in the method, costs which are not considered as exchange by actors in the network are modeled as self generated. Lastly, objects and services exchanges between actors in the SDBM blueprint that are non-financial, are also modeled in the VNA.

The notations for the value capture diagram in this method is depicted in figure 4.3. Considering the exchanges within an organization (dotted lines), the color of the lines indicates what kind of exchanges are conceptualized. Moreover, the actors within the box are business units from the respective organization. Lastly, all actors can have self-generated costs and benefits and therefore the same capabilities as the actor at the left of figure 4.3.

Based on the required steps to map the value capture diagram, the following steps have been derived to generate a value capture diagram from a SDBM blueprint:

1. **Map all organizations participating in the SDBM blueprint in the value capture diagram**
   In this first step only the organizations from the SDBM blueprint are mapped into the value capture diagram. The different actors within one organization will be mapped later.

2. **Map the exchange of financial costs and benefits between organization in the value capture diagram**
   Within the SDBM blueprint the costs and benefits of all actors are given in the third ring. In this step we explore how the financial costs and benefits are exchanged through
the network of organizations, meaning that we do not yet consider the separate business units. To do so, we map each financial cost or benefit of an organization, that results from participating the network, in the value capture network created in step 1.

3. **Map the exchange of non-financial value exchanges between organizations in the value capture diagram**
   The non-financial costs and benefits that are left in the SDBM blueprint are to be considered at this point. Again, we consider all non-financial cost and benefits between organizations and map these in the value capture diagram. Note that all these should be contractual or self generated organizational non-financial value exchanges.

4. **Map all object and service exchanges between organization in the value capture diagram**
   As all contractual financial and non-financial costs and benefits are mapped, we must map all relevant objects and services within the network. At this stage, we still only consider the between organization exchanges of objects and services.

5. **Map all participating business units from an organization in the value capture diagram**
   At this point, all exchanges between organizations in the network are mapped. To enable all exchanges through the network from the corporate organization, the participating business units in the SDBM blueprint are mapped. To clarify that these are in one organization, all business units are within a square and their exchanges are to be mapped with dotted lines. Finally, all exchanges between different organizations are mapped to the business units that are negotiating in the considered value capture diagram, to ensure visibility in how exchanges are done.

6. **Map all financial and non-financial costs and benefits of business units within an organization in the value capture diagram**
   In this step we repeat step two and three for the business units within a corporate organization. As mentioned earlier, all exchanges must be mapped with dotted lines to clarify the difference.

7. **Complete the value capture diagram**
   In this last step we consider all costs and benefits that are not yet mapped in the value capture diagram. In case the costs and benefits are self generated, they must be mapped in the value capture diagram. Any costs and benefits that are not mapped after this step, are not considered in the concretization process.

The value capture diagram resulting from step 1 of our method, is considered as the input for step 2, which focuses on the concretization of the value capture diagram.
4.4 Method step 2 - Concretization of Value Capture Diagram

In the second step of this method we propose a method regarding costs and benefits per organization for a service-dominant business model in a corporate setting. Designing this method requires all actors to share information with the contributing actors in the business model design. However, not all actors want to share all information with all actors involved in the business model design (Flint & Mentzer, 2006). Consequently, a structure is required to support the governance of information sharing during the concretization of the service-dominant business model. Reypens et al. (2016) identified the network and actor level to conceptualize value capture in networked settings. Moreover, Gilsing, Turetken, Ozkan, Adali, et al. (2020) introduced next to the network (public level) and actor (private level) a third level called the restricted level. In our method we split the private level into two levels, which we call the private level organization and business unit part. The communication to the other levels is done via the interacting actors, depicted in the value capture diagram. Therefore, only the interacting actors can directly influence the restricted and public levels and the other business units can only influence these levels indirectly. Accordingly, the proposed method consists out of three main levels: the public level (at this level all information will be shared to all actors), the restricted level (at this level only actors involved at a particular exchange will be involved) and the private level split into organization (at this level all information regarding an actor will be visible) and business unit (at this level information for a business unit of an actor will be visible). We summarized the information above in figure 4.4.

Figure 4.4: Levels of concern for concretization of SDBMs in a corporate setting

Based on the above described levels of concern, we derive three design parameters. The derived design parameters will be used to quantify the cost and benefits of the value model derived from the service-dominant business model. The three design parameters categories are; public parameters, restricted parameters and private parameters which are mostly created at the business unit level. The public parameters are concretized and quantified by all organizations in the network, and will be used for the financial costs and benefits on the
public level. An example of a public parameter is the number of treatments that are done in a hospital with the provided service of the network. The restricted parameters are used to concretize and quantify the financial costs and benefits on the restricted level, therefore these parameters are based on the input of organizations contributing at the restricted level. An organizations can contribute on multiple restricted parameters, there is no limitation to this. An example for a restricted parameter is the price which is being paid by an organization for a service to another organization.

Lastly, we have the private parameters from the organizational level and business unit level. In our method we use organization parameters and business unit parameters, however keep in mind that both of these are private parameters in the end. Mostly, private parameters are concretized at the business unit level, because at the business units are the owners of the delivered product or services. Also, within the SDBM blueprint the costs and benefits of an organization are pointed to a particular business unit. However, some private parameters are concretized at the organizational level, therefore we maintain the possibility of adding additional private parameters there as well. The private parameters at the organizational level could be also relevant over coupling information for the underlying business units. Moreover, all private parameters of the different business units are always aggregated at the organizational level. An example of a business unit parameter is the operational costs required to deliver a service.

The process to concretize the value model is depicted in figure 4.5 and explained thereafter.

Figure 4.5: Support of concretization value model of SDBMs in a corporate setting
1. Determine information required to concretize costs and benefits

Description: The first step in the support of concretizing the value model of SDBMs in a corporate setting is for each business unit to concretize the related costs and benefits. As explained, the concretization of costs and benefits can be done on multiple levels, depending on the actors involved. Costs and benefits that are accrued on the basis of exchange between multiple organization are modeled via restricted or public parameters. In contrast, concretization of costs and benefits that are only dependent on one organization are modeled via private parameters. Moreover, as corporate organization are divided into several business units, the concretization of the costs and benefits are mostly done at the business unit level. Considering this step, each contributing business unit should obtain a detailed understanding of necessary information to concretize costs and benefits.

Output: Understanding of information needed to concretize the costs and benefits in the business unit

2. List all information required to concretize costs and benefits of the organization

Description: For this step, the organizations receive the information to concretize all costs and benefits of the business units. Combining this information, all information required for concretizing the costs and benefits at the private level is obtained. It is also important to gain understanding in what information is needed to concretize the costs and benefits on the other levels. Within this step each organization defines the information needed to concretize the costs and benefits on all levels. Moreover, at this point in time the organization defines what information is required for the private parameters that must hold for all contributing business units. For example, the market in which the business model takes place and the desired WACC.

Output: Understanding of parameters needed to concretize total costs and benefits

3. Concretize public parameters

Description: Within this step, all contributing organization will discuss and concretize the public parameters needed for the value model. Examples of these parameters are; the number of customers expected for the delivered service or the number of customers coming to an event. Public parameters will, in the end, influence the value model highly. The public parameters are always set in collaborations with all actors and require an open information sharing within the business network.

Normally, setting the public parameters will require an iterative process. This could result in a set of public parameters which are already agreed upon by the network and a set of to be defined parameters. However, when the network cannot agree upon the concretization of the public parameters, the value model concretization can be cancelled. A cancellation will either stop the network collaboration or requires a service-dominant business model re-design. Once the public parameters have been defined, a message is send to the restricted level to preliminary concretize the restricted parameters.

Output: A set of concretized public parameters for the value model

4. Preliminary concretize restricted parameters

Description: This step concretizes preliminary the parameters on the restricted level. Exam-
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Examples of restricted parameters could be the pricing models used, but also parameters regarding collaborative costs could be preliminary concretized at this point. Note that the values set for the restricted parameters are not yet final, however, each organization can use the preliminary values to evaluate the to be made value models. When each organization, in collaboration with their business units, make their value model, the negotiation for the final values for the restricted parameters begins.

Considering figure 4.5 it can be seen that this step could be an iterative process. If the organization involved on the restricted level cannot agree upon the preliminary values for the restricted parameters, a cancellation of the concretization process can be requested. When all organizations agree with the preliminary values of the restricted parameters, a request is sent to all organization to concretize their value models.

**Output:** Set of preliminary values for restricted parameters to concretize private value models

5. Concretize organization parameters

**Description:** At this point organizations start to define the first part of the private parameters, that are needed to concretize the value model. Examples of the organizational parameters are the country or market of the deal and the weighted average costs of capital (WACC). As this action is on the private level, none of the other organization involved in the collaboration network have to be involved by defining those parameters.

**Output:** Set of concretized organizational parameters to concretize sub-value models

6. Concretize business unit parameters

**Description:** Besides the organizational parameters, also the separate business unit parameters must be concretized, to enable the concretization of all private parameters. Based on the self-generated costs and benefits, the business unit parameters must be concretized. Examples are the costs of goods sold, cost of market sales and pricing of the services delivered by a business unit. While these business unit parameters are also on the private level, no other organization must contribute on concretizing these parameters.

**Output:** Set of concretized business unit parameters to concretize sub-value models

7. Build sub-value model

**Description:** Based on the public parameters, the preliminary restricted parameters, the organizational parameters and the business unit parameters a sub-value model for each business unit can be generated. Each cost-benefit item is quantified and transformed to an upfront decided frequency or unit, to be able to analyze the financial performance of each business unit. This approach is in line with the traditional cost-benefit analysis. Once each business unit made their sub-value model, we can proceed to creating a value model for the complete organization.

**Output:** concretized sub-value model to analyse the financial performance of a business unit of the respective organization

8. Determine desired values for restricted parameters

**Description:** At this point the business units have to determine the desired values for the restricted parameters where they are indirectly involved via the communicating BU. A
business unit only determines desired values for the restricted parameters that matter to their business. By the creation of the sub-value model each business unit can determine the values needed to have a positive cost-benefit analysis and therefore a positive business case. Keep in mind that not only monetary objectives have to be taken into account, but all objectives found in step 1 of this method. Through the use of what-if variables the business units can easily find the profitability of the proposed service-dominant business model design. The results of these analyses are used in the negotiations for the desired values for the restricted parameters for the organization.

**Output:** Set of desired values for restricted parameters per business unit of the respective organization

9. **Build total value model**

**Description:** In this step the value models of all contributing business units in an organization are combined. At this point in time we make use of the public, preliminary restricted, private (organizational and business unit level) parameters to finalize the total value model. Each cost-benefit item is quantified and transformed to a upfront decided frequency or unit, to be able to analyze the financial performance of the entire organization. At this point we can go to the next step to define under which circumstances the service-dominant business model will be a success for the respective organization.

**Output:** concretized value model to analyse the financial performance of the respective organization

10. **Negotiate desired values for restricted parameters**

**Description:** The next step is to determine the desired values for the restricted parameters from an organization point of view. All business units at this point have already defined what would be positive values for each of them, however, this does not always have to be favorable for the entire organization. Sometimes, an organization does not have to make profit on all services and products they contribute in the network, as long as they make profit in total. Again, keep in mind that we do not talk only about positive costs and benefits in monetary terms, these could also be social or environmental. Through a what-if analysis the organization can determine what values for the restricted parameters would be good for the organization. Note, this step is called a negotiation on the desired values, resulting in business units contributing finding those desired values. It could be possible that a business unit is not making profit after this negotiation, normally the total profit is then somehow divided over all contributing business units. Finally, these negotiations can end in either a set of desired restricted parameters, a re-evaluation of the sub-value models created by the business units or extremely in a request to cancel the concretization of the value model.

**Output:** Either set of desired values for restricted parameters per organization, request to re-evaluate the sub-value models, or a request to cancel the concretization of the value model

11. **Negotiate value of restricted parameters**

**Description:** At this point all actors determined their desired values for the restricted parameters involving their organization. For each restricted parameter on the restricted level a negotiation takes part between all involved organizations, which is a critical part of the value model concretization. The concretization of the value model is highly dependent on
this step, because now organizations have to negotiate to have as good as possible restricted parameters for their own purposes. This step could result in different outcomes for restricted parameters. However, to be able to concretize the full service-dominant business model, each parameter should be accepted after all iterations. The first outcome after the negotiation is an agreement on the respective restricted parameter. Secondly, organizations could decide to re-evaluate their value models, and therefore also possibly re-evaluate their business unit sub-value models. Lastly, a cancellation of the concretization of the value model could be proposed, resulting in a re-design of the service-dominant business model or a complete cancellation.

**Output:** Either an agreement on set of restricted parameters, request to re-evaluate the sub-value models, or a request to cancel the concretization of the value model

### 12. Concretize restricted parameters

**Description:** If all organizations acting on the restricted level agree on the negotiated values of the restricted parameters, the values can be concretized. Thereafter, an agreement can be sent to public level, meaning the complete network. At this point, only an agreement is sent, values of the restricted and private level have never to be communicated with the levels above. Finally, if all actors agreed and the agreements is send, the financial evaluation can be seen as successful.

**Output:** Set of agreed concretized restricted parameters

### 13. Cancel concretization of value model

**Description:** During the concretization process some evaluation stages are build in, basically when multiple organizations must work together to agree on values for parameters there is an evaluation. If organizations are not able to agree upon the values for either the public or restricted parameters a cancellation or revision of the service-dominant business model is needed. However, even within an organization when business units cannot agree upon the desired values for the restricted parameters a cancellation request can be sent. A cancellation will result in the termination of the service-dominant business model, or the business model will be revised. However, revising the business model can result in addition of extra costs and benefits to create a suitable service-dominant business model.

**Output:** Cancellation of service-dominant business model or request for revision of the service-dominant business model

### 14. Finalize concretization of value model

**Description:** If the negotiations in the restricted level succeed, the decision making process can be finalised. Successful negotiations will result for each actor in positive objectives in terms of costs and benefits. Note that, it does not have to be positive in monetary terms for the organizations, other factors can play a part as well. From this stage organizations can agree upon the collaboration contractually and start implementing the agreed upon service-dominant business model. Which finalizes the financial evaluation of the service-dominant business model in a corporate setting.

**Output:** Agreement between all organization contributing in the service-dominant business model design
4.4.1 Method step 2 - Excel tooling

To support the calculations in the concretization process of service-dominant business models, an Excel tool has been created. This tool should enable users to evaluate the value model created in the first step of our method. Figure 4.6 depicts the conceptual overview of the Excel tooling, showing the four different levels of dashboards with their functionalities. Each dashboard represents one of the levels of concern defined in figure 4.4. Data regarding the business units of an organization will be consolidated in the organization dashboard of the Excel tool. After discussing the frequencies in which the tool enables calculations, the different Excel dashboards will be further elaborated.

![Excel tooling for concretization of value model](image)

Figure 4.6: Excel tooling for concretization of value model

In the Excel several frequencies can be defined to be used for the concretization of the value model. These frequencies are listed in table 4.1. On each level of concern, for the costs and benefits of the actors in the network, it should be defined what frequency is required. For example, on the restricted level, an organization has to pay a monthly fee to another organization in the network, resulting in the frequency `per month`. A disadvantage of using Excel is that manually the user should specify the required public parameters for enabling using `per user` and `per invocation`. The frequencies specified in table 4.1 can be used in the column `frequency` on all dashboards. To explain, `per deal` means that the payment is made only once in the total deal delivery to the customer, where `per user` indicates the price that must be paid per customer of the service. Finally, `per invocation` relates to the times the service is used by a customer.
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<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per deal</td>
<td>Expresses the parameter per deal of the service</td>
</tr>
<tr>
<td>Per user</td>
<td>Expresses the parameter per user of the service</td>
</tr>
<tr>
<td><strong>Prerequisite</strong>:</td>
<td>the number of users per time unit must be specified as a public parameter</td>
</tr>
<tr>
<td>Per invocation</td>
<td>Expresses the parameter per invocation of the service</td>
</tr>
<tr>
<td><strong>Prerequisite</strong>:</td>
<td>the number of invocations per time unit must be specified as a public parameter</td>
</tr>
<tr>
<td>Per second</td>
<td>Expresses the parameter per second</td>
</tr>
<tr>
<td>Per minute</td>
<td>Expresses the parameter per minute</td>
</tr>
<tr>
<td>Per hour</td>
<td>Expresses the parameter per hour</td>
</tr>
<tr>
<td>Per day</td>
<td>Expresses the parameter per day</td>
</tr>
<tr>
<td>Per week</td>
<td>Expresses the parameter per week</td>
</tr>
<tr>
<td>Per month</td>
<td>Expresses the parameter per month</td>
</tr>
<tr>
<td>Per year</td>
<td>Expresses the parameter per year</td>
</tr>
</tbody>
</table>

Table 4.1: Frequencies embedded in the Excel Tooling

Public Excel dashboard

The first tab in the Excel tooling represent the public dashboard, which is depicted in figure 4.7. In the public dashboard the public parameters, defined by all actors in the network, are shown. The information shown at this level is required by all actors in the network to either specify restricted parameters or private parameters at a later stage in the concretization process. In the public dashboard *name, frequency* and *value* must be specified. The *name* refers to the specification of what the parameter is about, this could be regarding any information required by the entire network. *Frequency* refers to table 4.1, and specifies how often the parameter is used in the business model design. Lastly, *value* refers to a quantity, answering the question of how much is used given a certain frequency.

<table>
<thead>
<tr>
<th>Name</th>
<th>Frequency</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public parameter 1</td>
<td>per month</td>
<td>1</td>
</tr>
<tr>
<td>Public parameter 2</td>
<td>per month</td>
<td>1</td>
</tr>
<tr>
<td>Public parameter 3</td>
<td>per day</td>
<td>1</td>
</tr>
<tr>
<td>Public parameter 4</td>
<td>per day</td>
<td>1</td>
</tr>
<tr>
<td>Public parameter 5</td>
<td>per day</td>
<td>1</td>
</tr>
</tbody>
</table>

This tab serves to concretise the **public parameters**. All information needed by the network that can be publically shared is concretised here by means of the structure and value set for the parameters.

Figure 4.7: Excel tooling public dashboard
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The public dashboard maintains information required by all actors in the network, however still someone should own the information to ensure validity of the information. We propose the organization responsible for setting up the service-dominant business model design to be the owner of the public dashboard. Although each organization could maintain the information on the public level, we think the focal organization works best. However, one could choose to have another owner of the public dashboard, if agreed by all actors in the network. Again, all specified information of the public level is used to do the calculations on the private level.

Restricted Excel dashboard

The second tab in the Excel tooling represents the restricted dashboard, which is depicted in figure 4.8. At this tab, the specified parameters are only known by the organizations take part on the negotiations of the respective parameter. One disadvantage of this Excel tool is that it is not possible to show an organization only the relevant parameters for that organization, also irrelevant information of other organizations is visible at this point. Ideally, the model only shows the information relevant for the respective organization.

Each restricted parameter has the attributes name, frequency, value, provider organization, provider business unit, receiver organization and receiver business unit. The provider and receiver attributes are needed to indicate who is the recipient of the value of this parameters (therefore relevant to concretization of benefits) and who is the provider (which corresponds to the concretization of costs). An example of this is parameter 1, where business unit 2 of organization 2 pays business unit 1 of organization 1. As the Excel tooling is a general tool we work with organization 1 and business unit 1 etc., however when using the tool in practice names should be given to those. Depending on the exchanges present for the business model design, any restricted parameters can be added here, which on the basis of the provider and receiver role are forwarded to the private dashboard (either the costs and benefits) of the respective organization and business unit. If a restricted parameter is only to be considered at the organizational level, provider or receiver business unit must not be filled.

The parameters in the restricted dashboard must be specified by the actors of concern for the given parameter. As for the concretization process, in step 4 the preliminary values for the restricted parameters will be specified. These will not be the final values for the restricted parameters, as first the organization have to evaluate their value models using the public parameters and preliminary parameters. Thereafter, the organizations of concern must negotiate on the final values for all restricted parameters. Once all parameters are finalised the concretization of the value models can be accepted on the public level. However, when organization cannot agree upon a value on the restricted level after the negotiation, the concretization of the value model could be rejected. Keep in mind that this is an iterative process and steps can be done several times during the concretization.
Private Excel dashboard

The third tab in the Excel tool is the private level, as discussed in figure 4.4 this is split into organizational level and business unit level. At this first tab the organizational level will be displayed, showing the information for the complete organization. Thereafter, all business units within the network have their own tab calculating their cost-benefit analysis. The design of both the organization tab and business unit tab are similar, that design is depicted in figure 4.9. Again, the difference here is at the organizational level all information is available while at the business unit level only the relevant information for the respective business unit is available. From this point we will discuss the elements on the organizational dashboard and business unit dashboard in one and refer to both of them as the private dashboard.

The private dashboard contains information regarding the relevant public, restricted and private parameters. The private dashboard is split into benefits based on restricted and private parameters and costs based on restricted and private parameters. Moreover, the private dashboard enables a what-if analysis to understand if different public and restricted cost and benefit parameters result in positive outcomes. Finally, a result section is shown at the private dashboard, showing if the combination of all relevant parameters results in a financial satisfactory result or not. The separate parts of the private dashboard are explained in more detail below.
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Information regarding benefits on private dashboard
In figure 4.10 the benefits shown in the private dashboard are depicted. These are the benefits for a business unit, which will be all automatically transferred to the organization as well. At the left of figure 4.10, benefits from the restricted dashboard are shown. When a particular business unit is placed as receiver on the restricted dashboard, the benefit will be automatically displayed here together with its corresponding name, frequency and value. As those are negotiated on the restricted level, they should not be adjusted at the private level. For all restricted parameters, based on the detailed information, the total yearly benefits will be calculated. Moreover, the user of the Excel tool can calculate another total per time unit. In the tool we incorporated total per month, total per week, total per day and total per invocation as options for total per time unit. Finally, the total of all restricted parameters are calculated based on the specified time units at the top.

Moreover, all actors at this level can specify the self-generated benefits on the right of figure 4.10. Here one should specify again the name, frequency and value. The value should be based on the chosen frequency corresponding to table 4.1. Accordingly, similar as described above, the totals for the given time units per benefit are calculated and the overall total benefits based on private parameters is calculated at the bottom.

![Figure 4.10: Excel tooling private dashboard - benefits](image)

Information regarding costs on private dashboard
After the benefits shown on the private dashboard, the costs are shown which is illustrated in figure 4.11. The same as for the benefits, all costs specified at the business unit level are automatically transferred to the organization level. The costs are split into three segments, costs based on the restricted parameters, fixed costs based on private parameters and variable costs based on private parameters. Considering the costs based on restricted parameters, the information shown is directly coming from the restricted level based on the provider organization and business unit. From the restricted level the name, frequency and value is transferred, based on this information again total yearly and monthly (or other specified time unit) costs per parameter are calculated. Finally, at the bottom of the table the total costs per time unit based on all relevant restricted parameters is calculated.

Besides costs based on restricted parameters, costs based on self-generated private parameters are specified in the tables of 4.11 as well. These costs are split into two segments, fixed costs and variable costs. Fixed costs only occur once, while variable costs are costs based on the frequencies of table 4.1. For the table with fixed costs based on private parameters, only name and value is relevant to calculate the required total fixed cost output. However, for the variable costs also the frequency is required to enable the calculations for the total yearly and monthly (or other time unit) costs based on the private parameters.
Information regarding what-if analysis on private dashboard

The information listed at the private level that is based upon private parameters is not shared with other actors in the service-dominant business model design as it is often sensitive or strategic information. Based on this information and the values for the public and restricted parameters, the final cost-benefit calculations are done on the private level. To enable each user to prepare for the negotiations of parameters values on the restricted and public level, the what-if analysis is added to the private level, such that no sensitive private information must be shared while investigating different values for other parameters. On business unit level, each business unit can use the what-if analysis to come up with desired values for restricted parameters to be used in step 10 of the concretization process (figure 4.5). While on organizational level, each organization can use the what-if calculations for the negotiation with other organizations in step 11.

In figure 4.12 the tables for simulations of different values of public and restricted parameters are depicted. All information in the colored parts of the tables is directly transferred from the public or restricted dashboards. If a user wants to simulate different prices for these parameters, they can just change the values in the what-if tables and automatically new results will be shown in the results section. For each, the public parameters and benefits and

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costs based on restricted parameters the user could change the \textit{WI frequency} and \textit{WI value}. Using the new values, new totals per time unit will be calculated and what-if results will be shown in the results table. Concluding, by using the what-if analysis at the private level users can simulate different values for restricted and public parameters while not sharing sensitive private information.

\textbf{Information regarding results on private dashboard}

Based on all relevant information from the public, restricted and private parameters the cost-benefit calculation will automatically be done. The results table used for the output of these calculations is depicted in figure 4.13. From the parameter values in the private dashboard, the operational yearly profit is calculated. Meaning that fixed costs are not considered in the yearly cash flow of the operational profit. Thereafter, the financial evaluation measures NPV (equation 2.3) and payback (equation 2.2) are used to evaluate the service-dominant business model financially for the respective actor. To enable the use of the NPV a discount factor and life cycle time must be defined, where the discount factor should be between 0 and 1 and the life cycle time in years. Different business units can have different values for the discount factor and life cycle time, therefore calculations are done at business unit level and transferred to the organizational level. This means that at the organizational level no discount factor and life cycle time are to be defined. Besides the NPV also the payback period for the deal is calculated, based on the investment costs the payback period gives the amount of years till the break-even point (benefits equal costs).

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure4.13.png}
\caption{Excel tooling private dashboard - results}
\end{figure}

The private level is split into an organization dashboard and several business unit dashboard. Therefore, at the organizational level all information of the different business units is consolidated in the results. To make it more explicit on the organizational level to understand what value come from what business unit, we added a graph showing the NPV’s of the different business units. The graph is depicted in figure 4.14. By using the graph the user at the organizational level can understand where changes could be made to come up with a more viable business model for the corporate organization.
On the private level the user can do the what-if analysis to prepare for the negotiations at the private and restricted level. The results table (4.13) gives also the results for the simulated values of the public and restricted parameters. By applying these type of analyses the user could define under which circumstances the service-dominant business model design is accepted. Normally, the value for the NPV should be positive, while considering all costs and benefits, as an organization requires some profit. However, non-financial benefits could be important and the user could conclude with a negative NPV to go forward with the business model. In the Excel model we enabled our users with guidance for the what-if analysis, which is shown in figure 4.15. The user can choose a parameter defined in the public or restricted dashboard to change to another value. To change this value the user should choose a desired value for the what-if NPV and press calculate value, resulting in the new required what-if parameter value. Finally, the payback period should not be equal to infinite, resulting in a business model that could not be paid back. Again, other requirements could force the user to go forward with the proposed business. Concluding, the results section enables the user to evaluate the business model design based on their own strategic objectives.
4.4.2 Method step 2 - Excel tooling user guide

To be able to use the Excel tooling properly we set up brief user guide how each step in the concretization process is supported by the tool. In the user guide we specify if a step is automated, user-oriented or manual. Automated tasks are fully supported by the Excel tooling, user-oriented tasks require user input and manual tasks are not yet supported by the proposed Excel tool. We consider each of the steps given in figure 4.5 separately below.

1. **Determine information required to concretize costs and benefits - Manual task**
   The first step of the concretization process is a manual task. During this task users investigate on business unit level the information required to specify the costs and benefits used in a later stage of the concretization process. The investigation as necessary to continue the concretization process, however is not yet included in the Excel tooling.

2. **List all information required to concretize costs and benefits of the organization - Manual task**
   The second step of the concretization process is a manual task. During this task users list all information gathered by the respective business units and investigate all extra information required on organizational level. This information will be used for further concretization of the value model.

3. **Concretize public parameters - User task**
   The concretization of the public parameters is supported by the Excel tool. At this point the actors in the network discuss on what information is required for the complete network and concretize these parameters in the Excel tool. We proposed that these parameters are concretized by the focal organization on the public dashboard of the tool. Thereafter, can all actors use the information for the cost and benefit calculation at the private level.

4. **Preliminary concretize restricted parameters - User task**
   At this step the users preliminary concretize the restricted parameters, which will be recorded in the Excel tool at the restricted dashboard. Only users who are involved in the respective dashboard are contributing at this moment of preliminary concretization, those users are specified as provider and receiver in the restricted dashboard. Thereafter, can the respective actors of the restricted parameters use the information for the cost and benefit calculation at the private level.

5. **Concretize organization parameters - User task**
   After preliminary concretizing the public and restricted parameters, the private parameters will be concretized in the Excel tool. First parameters only concerning the complete organization are concretized in the private dashboard organization tab. These organization parameters will be used by the automated cost-benefit calculation incorporated in the model. The user can choose what frequency next to yearly is visible in their dashboard.

6. **Concretize business unit parameters - User task**
   In the same manner as the organizational parameters, the business unit parameters are concretized. All the business unit parameters will be automatically shift to the private dashboard organization tab as well. Again, the specified parameters will be automatically used in the cost-benefit calculations. Also, can the user choose what frequency next to yearly is visible in their dashboard.
7. **Build sub-value model - Automated task**
Based on the relevant specified public, restricted, organization and business unit parameters the Excel tool will perform the automated cost-benefit analysis for each business unit. The analysis is based on the financial performance evaluation measures specified in chapter 2.5.

8. **Determine desired values for restricted parameters - User task**
Based on the outcomes of step 7, each business unit should understand if the outcomes of the cost-benefit calculations are satisfactory or not. By using the what-if analysis incorporated in the tool, the business units can calculated under what circumstances for the public and restricted parameters a deal would have a positive outcome. The tool enables the user to specify what parameter value to change to come to a desired NPV value, and calculates that value for the user after pressing the button. The outcomes of the what-if analysis can be used to negotiate with the complete organization on the required public and restricted parameters.

9. **Build total value model - Automated task**
Based on all public, restricted, organizational and business unit parameters of the respective organization, the Excel tool automatically performs the cost-benefit calculations. Again, the analysis is based on the financial performance evaluation measures specified in chapter 2.5.

10. **Negotiate desired values for restricted parameters - Manual task**
This step is not supported with the Excel tool only a supporting graph is given on the organizational level. During this step all business units come together on organizational level to negotiate upon the desired values for restricted parameters. Based on the cost-benefit analysis done on business unit level they should decide upon the desired values. Finally, after the negotiations the desired values for the public and restricted parameters are decided.

11. **Negotiate value of restricted parameters - Manual task**
In line with step 10, this step is also not supported by the Excel tool. During this step all organization come together to negotiate upon the values for the restricted parameters. At this point all actors involved have to agree upon the values of the restricted parameters. For the final concretization of the value model, all restricted parameters have to be concretized, meaning that all involved actors agree upon the value. Note, this step could involve many iterations before agreeing on the values for restricted parameters.

12. **Concretize restricted parameters - User task**
If the negotiations on the restricted parameters with the respective organization were successful, the values for the restricted parameters can be concretized at the restricted dashboard. These will also give final values for the cost-benefit analysis on all private levels. After this step the total service-dominant business model can be accepted or rejected.

13. **Cancel concretization of value model - Manual task**
During the concretization process actors in the service-dominant business model could choose to reject the concretization of the value model. If this happens, it requires the users to manually re-design the business model design or stop the collaboration.

14. **Finalize concretization of value model - Manual task**
If the negotiations on all parameters are successfully finished, the value model concretization can be accepted. At this point, organizations typically set up contracts to agree upon the business model design and negotiated parameter values. Thereafter, the new business model design is implemented in practice. As no calculations are required, this is a manual step.
Chapter 5

Demonstration

We illustrate the application of our method by means of a case scenario at the case company. Before applying our method we derive the service-dominant business model design from the information provided by the case company, based on the process described in section 4.2.1. This will be explained first in this chapter of the thesis. Thereafter, the steps proposed in figure 4.1 are followed, meaning that we first create the value capture diagram. Thereafter, the value capture diagram is concretized and analysed for acceptance negotiations of the service-dominant business model design. A detailed discussion of this method its steps can be found in section 4.3 and 4.4. The complete application of the case scenario is done in close collaboration with the solutions leader of the case company, who is responsible for the shift towards service-dominant business models at the case company. Moreover, several additional employees of the case company have been involved in for example acquiring the required information.

5.1 Service-dominant business model blueprint of case scenario

Before our method to support the concretization of the value model can be applied, first a service-dominant business model blueprint must be made for the case scenario. To design this business model, the steps of section 4.2.1 are taken to create the SDBM blueprint. In figure 5.1 the SDBM blueprint of the case scenario is depicted, the creation of the SDBM blueprint is done in close collaboration with among others the solutions leader of the case company. The creation of the final SDBM blueprint was an iterative process. The SDBM blueprint in created in the healthcare sector, by combining several organization and business units the customer value can be maximized and the best possible care infrastructure can be delivered, while maximizing profits for all involved organizations. Finally, for privacy reasons, the SDBM blueprint is anonymized. Therefore we speak about, the customer, the case company and the third party organization. The case company consists out of the departments depicted in figure 5.1. A more extensive elaboration on the SDBM blueprint is given after the figure.
The SDBM blueprint is focused on providing a coherent service to the customer by improving the collaboration between the different actors in the network. Not only different organization are working together, but also different departments/business units within a single organization collaborate to achieve the coherent service for the customer. At the center of the circle the value-in-use is visualized. The value-in-use focuses on a high quality and cost efficient care infrastructure for patient treatment at the customer. This value-in-use improves the customer’s patient treatment while being more cost efficient. To obtain the value-in-use different stakeholders are defined, all having their own role in the service delivery. The sales department is defined as the focal actor, meaning that it is the direct contact point for the customer and orchestrator of the given service.
Next to the value-in-use, the value proposition for all actors is defined. All value propositions together ensure that the value-in-use is obtained by the actors in the network. Hereby, it is important to specify the responsibilities of each actor to better coordinate the service. For some departments their contribution is the delivery of high quality goods, while other departments guarantee that the goods stay functional. Others support the collaboration between the different organizations involved, to ensure the best quality is delivered. A third party organization is found to enhance the total service for the customer even more, by delivering comprehensive goods and services to the customer. The addition of the third party makes the value proposition of the network more complete. Moreover, the customer shares their needs and perform with the delivered service from the network the required patient treatments. Information regarding all actors in the network is depicted in the second layer of figure 5.1.

In the next layer, the high-level activities for all actors are defined. In this paragraph a brief overview of the actors its high-level activities is given, detailed information can be found in the SDBM blueprint. The focal actor, the sales department of the case company, their main activity is to sell the network its service to the customer while communicating with all actors in the network. Moreover, this is not the normal way of doing business at this moment in the case company, therefore the sales department should transform their way of working and train people to deliver the right value for the customer. Considering the role of the equipment and consumables department their main activities are producing and shipping their products to the customer. While the service department is responsible for maintaining the products and software incorporated in the products. Moreover, the IT department of the case company ensures that the systems of the hospital and the systems of the products work optimal together. The solutions department of the case company ensures that the different departments start working together to come up with new business models. They also train people in selling cross department solutions instead of everyone selling their own product or service. The last activity of the solutions department is to maintain partnerships with third parties to further enhance the value proposition. The third party organizations itself delivers extra products and services to enhance the total value-in-use of the network. Moreover, they maintain contact and share information with the relevant parties. Lastly, the customer receives the products and services to do patient treatments and shares information with the stakeholders to have the best experience.

The last layer defines the costs and benefits each actor collaborating in the network has. This layer is the most important layer for the method we proposed. The costs and benefits defined in this layer can be segmented into exchange of financial costs and benefits, exchange of non-financial costs and benefits and exchange of objects and services. The different groups will be used to create the value capture diagram for the case scenario based on figure 4.3. The translation to the value capture diagram is required to understand how the costs and benefits are exchanged through the network. Finally, with that information one can understand if the service-dominant business model blueprint is profitable for all involved actors.
5.2 Step 1 - Derive value capture diagram of case scenario

Using the procedure elaborated in section 4.3 and the notation depicted in figure 4.3, we have generated the value capture diagram for the case scenario, shown in figure 5.2. The value capture diagram is further elaborated below.

![Diagram of value capture diagram](image)

Analyzing the value capture diagram captured from the SDBM blueprint, one can see that all costs and benefits from the blueprint are embedded into the value model. This enables us to understand how the model is explicitly structured between all parties in the SDBM blueprint. Accordingly, the value capture diagram shows the user what costs and benefits are from the service exchange and which are self-generated. As shown in the notation of the value model:
capture diagram (figure 4.3, we distinguish between three different costs and benefits. Namely, exchange of financial costs and benefits (blue), exchange of non-financial costs and benefits (orange) and exchange of goods and services (green). In addition, some extra costs and benefits are added to the value capture diagram when comparing it with the SDBM blueprint. This does not change anything on the SDBM blueprint, as for example the equipment fee is still paid to the equipment department. However, the equipment fee is paid first to the sales department, which is the communicator with the customer, and from there paid to the equipment department.

The sales department within the case company is the focal actor in the SDBM blueprint, from the value capture diagram can be seen that the sales department actually has this orchestrating position in the network. It shifts all value from the case company to the customer and vice versa, while keeping track of the collaboration. Considering the customer of the case scenario, we see from the value model that most goods and services are delivered to them in exchange for financial benefits. While the collaboration between the other organizations is more in terms of information rather than goods and financial exchanges. Finally, one can also see that within the case company the exchanges make sense (business units get their own payments and costs) and therefore the different departments act as some kind of organization on their own as well.

By using the value capture diagram, the user can make explicit what financial transactions are exchanged between actors and what transactions are self-generated costs and benefits. From the value capture diagram, the incoming blue descriptions mean benefits for the actor and outgoing blue descriptions mean costs for the actor. The exchanges of those financial costs and benefits are highly important for the next step of our method, as they require negotiations upon their values. These will be translated to mostly restricted parameters after this step, to enable negotiations between different organizations. Finally, one can translate the self-generated costs and benefits to private parameters, mostly considering the private business unit parameters. In the next step the blue descriptions are translated into the corresponding parameters and concretized to enable analyzing the value capture diagram.
5.3 Step 2 - Concretize value capture diagram of case scenario

In this step the value capture diagram is concretized and analyzed, to understand for all actors in the case scenario if the proposed service-dominant business model design is viable or not. To do this in a systematic way, we follow the proposed process in figure 4.5. We also use the Excel model created to enable the calculations for all actors viability. In this step we will go through the complete process for the case company, because we have the right data from them and analyzing all actors would be rather time consuming. Also, we focus as an example on the consumables department, however, at organization level all business unit information is consolidated. The consumables department is chosen because it has both self-generated fixed and variable costs, which makes the results section most interesting. Note that all numbers and actors within our case scenario are anonymized, as it is based on sensitive information.

1. Determine information required to concretize business unit costs and benefits
   As discussed, we will focus on the consumables department to understand what information they require. As shown in figure 5.2, the consumables department gets a fee for the consumables they sell and to be able to sell them have a fixed costs in the beginning and operational costs per consumable. The required information for the consumables department is not only what costs they have and what their selling prices are, they also require information regarding the amount of consumables sold to the customer and for what contract duration. Moreover, the type of consumables sold to the customer is also important to understand. Information regarding the price and contract duration is exchanged on restricted level and should therefore be negotiated with other actors. Information regarding what type of consumables and how many is in the case scenario discussed on the public level together with all organizations. Lastly, information regarding the costs of the consumables department is self-generated and therefore does not depend on other actors in the network. This step is manually, and should therefore not yet be modeled in the Excel model.

2. List all information required to concretize costs and benefits of the organization
   At organizational level all information required to concretize all relevant parameters for the business units is consolidated. At this point, also additional information required for the organization will be investigated here. For our case scenario at organization level only information regarding the discount rate is required. However, the organization also needs to understand under what circumstances the business model is viable, as it not always requires all separate business units to be viable.

3. Concretize public parameters
   The output of step 1 and 2 requires the total network to discuss what type of treatments are done by the customer to deliver a high quality and cost effective care infrastructure for those treatments. The information is shared with all actors and all levels in the network, enabling them to do the right calculations. For the case scenario the public parameters are depicted in figure 5.3. Finally, one can see that invocation X is done 120 times per year and invocation Y is done 80 times per year.
4. **Preliminary concretize restricted parameters**

Again, based on step 1 and 2, preliminary value have to be set for the restricted parameters based on negotiations between relevant actors. Possibly, the actors cannot come to a preliminary agreement, resulting in the termination of the concretization process. As this is not the case here, all relevant restricted parameters for the business units of the case company are depicted in figure 5.4. The figure explains who is the providing organization and business unit and who is the receiver organization and business unit. As can be seen, the case company pays only once something to the customer while it receives many different financial benefits. All different restricted parameters names are based upon the cost and benefit information stated in figure 5.1. The preliminary values of all relevant restricted parameters can be seen in figure 5.4, these are transferred to relevant actors on the private level.

<table>
<thead>
<tr>
<th>Name</th>
<th>Frequency</th>
<th>Value</th>
<th>Provider organisation</th>
<th>Provider Business Unit</th>
<th>Receiver Organisation</th>
<th>Receiver Business Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loyalty reward</td>
<td>per year</td>
<td>1800</td>
<td>Case company</td>
<td>Solution department</td>
<td>Customer</td>
<td>Equipment department</td>
</tr>
<tr>
<td>Loyalty reward</td>
<td>per year</td>
<td>1100</td>
<td>Third party organisation</td>
<td>Customer</td>
<td>Case company</td>
<td>Case company</td>
</tr>
<tr>
<td>Equipment fee</td>
<td>per month</td>
<td>1000</td>
<td>Customer</td>
<td>Case company</td>
<td>Case company</td>
<td>Consumables department</td>
</tr>
<tr>
<td>Device fee</td>
<td>per invoicing Y</td>
<td>80</td>
<td>Customer</td>
<td>Case company</td>
<td>Case company</td>
<td>IT department</td>
</tr>
<tr>
<td>IT fee</td>
<td>per month</td>
<td>210</td>
<td>Customer</td>
<td>Case company</td>
<td>IT department</td>
<td>IT department</td>
</tr>
<tr>
<td>IT service fee</td>
<td>per year</td>
<td>4500</td>
<td>Customer</td>
<td>Case company</td>
<td>IT department</td>
<td>Service department</td>
</tr>
<tr>
<td>Service fee 1</td>
<td>per year</td>
<td>2700</td>
<td>Customer</td>
<td>Case company</td>
<td>Service department</td>
<td>Service department</td>
</tr>
<tr>
<td>Service fee 2</td>
<td>per year</td>
<td>6650</td>
<td>Customer</td>
<td>Case company</td>
<td>Service department</td>
<td>Service department</td>
</tr>
</tbody>
</table>

Figure 5.4: Case scenario - restricted parameters

5. **Concretize organization parameters**

In step 2 we found that there are no organization parameters required for the case scenario. The only required information was regarding the discount factor for the NPV calculations and the knowledge regarding deal viability, which are no parameters to be defined itself. Therefore, at this stage no organization parameters are defined. The value for the discount factor is set on 0.07 for both the organizational level as the business unit level.

6. **Concretize business unit parameters**

In step 1 it was found to be required that several business unit parameters were defined. These were parameters regarding the fixed costs for consumables and the variables costs per sold consumable. As there are no negotiations required to define private business unit parameters no other actors are involved in setting the values for those parameters. In figure 5.5 the results for the fixed costs and different operational costs per consumable are defined. From this information, and the required information from the public level, the yearly and monthly costs are calculated. This information is transferred to the organizational level, moreover, this information is used to build the value and sub-value model later.
At this step for all different departments of the case company the business unit parameters are defined and consolidated at the organizational level. In figure 5.6 all these different fixed costs and operational costs are depicted. This information together will later be used to build the final value-model for the complete organization.

7. Build sub-value model
After all information from the relevant public and restricted parameters is combined with the business unit parameters, the Excel will calculate the results. All information that can be seen on the level of the consumables department is depicted in figure 5.7.
Using all the relevant information, and the knowledge that the discount rate is set equal to 0.07 for the NPV calculation, we only have to set the contract duration (time of business model life cycle). This time can differ among the different business units, and is therefore set at this level. Obviously, the contract duration is always to be negotiated with the other actors in the network. For the case scenario, the customer and the consumables department agreed upon a contract duration of 4 years, resulting in a NPV of approximately €26000 euros and a payback period of 1.6 years (figure 5.8).
8. Determine desired values for restricted parameters
In the previous step we ended with a result for the value model possibly being viable. When
the actor, in this case the consumables department, decides the current results are not yet
desired, a what-if analysis can be done in the Excel model. We illustrated this in figure 4.12,
where we showed that we could simulate different values for the private and restricted param-
eters. We assume that the consumables department think that the NPV is too low for a viable
business model, as they normally would make more money doing regular business. To have
a viable value model, we simulated different prices for the consumables. Consumables based
on invocation Y are simulated at a price of €200 instead of €180 and consumables based on
invocation X are simulated at price €110 instead of €100, resulting in the results from figure
5.9. Assuming that these results are profitable enough for the consumables department, the
parameter value differences can be used as a basis for the restricted parameter negotiations.
Note that a value model is not only dependent on the financial outcomes, it could be that
non-financial outcomes influence the desired outcomes as well.

<table>
<thead>
<tr>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operational profit</strong></td>
</tr>
<tr>
<td>Yearly profit based on current values</td>
</tr>
<tr>
<td>Yearly profit based on what-if values</td>
</tr>
<tr>
<td><strong>Net present value</strong></td>
</tr>
<tr>
<td>Discount rate</td>
</tr>
<tr>
<td>Time of business model life cycle (years)</td>
</tr>
<tr>
<td>NPV under current values</td>
</tr>
<tr>
<td>NPV under what-if values</td>
</tr>
<tr>
<td><strong>Break even analysis</strong></td>
</tr>
<tr>
<td>Payback time current values</td>
</tr>
<tr>
<td>Payback time what-if values</td>
</tr>
</tbody>
</table>

Figure 5.9: Case scenario - Consumables department value model results what if analysis

9. Build total value model
Using the same reasoning as in step 7 of this section, based on all relevant public, restricted
and business unit parameters, the value model for the case company can be created. The
total information required for creating the value model is depicted in figure 5.10. Again, that
information is used to calculate the results of the case company its value model, which is
shown in figure 5.11. For calculating the NPV at the organizational level no business model
life cycle time is stated, these life cycle times can differ among the business units and therefore
are specified at the business unit dashboards. Finally, by using all relevant information for
the case company it results in a NPV value of approximately €43500 and payback time of
3.7 years.
### CHAPTER 5. DEMONSTRATION

#### Figure 5.10: Case scenario - Case company value model

<table>
<thead>
<tr>
<th>Name</th>
<th>Frequency</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invocation X</td>
<td>per year</td>
<td>120</td>
</tr>
<tr>
<td>Invocation Y</td>
<td>per year</td>
<td>80</td>
</tr>
</tbody>
</table>

**Benefits based on restricted parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Frequency</th>
<th>Value</th>
<th>Yearly total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment fee</td>
<td>per month</td>
<td>1000</td>
<td>12000</td>
</tr>
<tr>
<td>Device fee</td>
<td>per invocation Y</td>
<td>180</td>
<td>1440</td>
</tr>
<tr>
<td>Device fee</td>
<td>per invocation X</td>
<td>100</td>
<td>12000</td>
</tr>
<tr>
<td>IT fee</td>
<td>per month</td>
<td>210</td>
<td>2520</td>
</tr>
<tr>
<td>IT service fee</td>
<td>per year</td>
<td>4500</td>
<td>575</td>
</tr>
<tr>
<td>Service fee 1</td>
<td>per year</td>
<td>2700</td>
<td>225</td>
</tr>
<tr>
<td>Service fee 2</td>
<td>per year</td>
<td>6650</td>
<td>80650</td>
</tr>
</tbody>
</table>

Total benefits based on restricted parameters: 54770

**Costs based on restricted parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Frequency</th>
<th>Value</th>
<th>Yearly total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loyalty reward</td>
<td>per year</td>
<td>1800</td>
<td>1800</td>
</tr>
</tbody>
</table>

Total costs of restricted parameters: 1800

**Fixed costs based on private organisation parameters and BU import**

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational costs equipment</td>
<td>70000</td>
<td>70000</td>
</tr>
<tr>
<td>Set up costs consumables</td>
<td>14000</td>
<td>14000</td>
</tr>
<tr>
<td>Set up costs IT</td>
<td>7200</td>
<td>7200</td>
</tr>
</tbody>
</table>

Total fixed costs based on private parameters: 9600

**Variable costs based on private organisation parameters BU import**

<table>
<thead>
<tr>
<th>Name</th>
<th>Frequency</th>
<th>Value</th>
<th>Yearly total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational costs Y</td>
<td>per invocation Y</td>
<td>115</td>
<td>9200</td>
</tr>
<tr>
<td>Operational costs X</td>
<td>per invocation X</td>
<td>65</td>
<td>7600</td>
</tr>
<tr>
<td>Operational costs service 1</td>
<td>per year</td>
<td>2000</td>
<td>2000</td>
</tr>
<tr>
<td>Operational costs service 2</td>
<td>per year</td>
<td>4850</td>
<td>4850</td>
</tr>
<tr>
<td>Operational costs IT</td>
<td>per year</td>
<td>2775</td>
<td>2775</td>
</tr>
</tbody>
</table>

Total variable costs based on private parameters: 2763

#### Figure 5.11: Case scenario - Case company value model results

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational profit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yearly profit based on current values</td>
<td>25345</td>
<td></td>
</tr>
<tr>
<td>Yearly profit based on what-if values</td>
<td>25345</td>
<td></td>
</tr>
<tr>
<td>Net present value</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Discount rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of business model life cycle (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPV under current values</td>
<td>43473.38738</td>
<td></td>
</tr>
<tr>
<td>NPV under what-if values</td>
<td>43473.38738</td>
<td></td>
</tr>
<tr>
<td>Break-even analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payback time current values</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Payback time what-if values</td>
<td>5.7</td>
<td></td>
</tr>
</tbody>
</table>
10. **Negotiate desired values for restricted parameters**

At this point all business units know under which circumstances a viable sub-value model is created. From now it is also important to understand the combination of all those viable sub-value models is also viable for the complete organization. Accordingly, to have a viable value model for the complete organization, not all sub-value models must be viable. Considering our scenario, the solutions department NPV is negative, but the NPV of all business units combined is positive. The case company itself should decide now if the total value model is viable or not. Assuming that the case company thinks the value model is not yet viable, we can do a what-if analysis using all different parameters from the business units. Again, the same what-if analysis is done as in step 8, where we raised the prices of the consumables. Resulting in a raise of the NPV to approximately €56000 and a lower payback time, which is depicted in figure 5.12. Finally, the input used for a viable deal at the organization level, should be used to negotiate on the restricted parameters. Finding a viable value model for the organization sometimes does not mean that each sub-value model is viable, this could lead to re-organising the benefits the organization receives.

![Figure 5.12: Case scenario - Case company value model results what if analysis](image)

11. **Negotiate value of restricted parameters**

After all organizations discussed internally what values for restricted parameters are required to get a viable value model, the relevant organizations negotiate upon those values. After this step, all restricted parameters must be accepted to enable the concretization of the restricted parameters. This is an iterative process and could therefore be a rather difficult task to do. However, if not all restricted parameters could be agreed upon, the value model concretization will be rejected. In our case scenario we found that the case company required a different price per consumable. The prices of consumables X and Y raised to 110 and 200 respectively. If the customer and the case company could agree on this slightly higher price, and no other changes are made, we could finalise the negotiation for the restricted parameters involving the case company and the customer (which we focused on).

12. **Concretize restricted parameters**

Assuming that all negotiations for the restricted parameters were successful, and values are found for all parameters, we can concretize the restricted parameters. The values for the restricted parameters can be changed and finalised. For our case scenario, the prices for the consumables are changed and other parameter setting stay the same.
13. **Cancel concretization of value model**
If at any moment during the concretization process discussions either on the public, restricted or organizational level break down, the concretization of the value model can be stopped. Assuming that in our case scenario all negotiations succeed, this step will be skipped.

14. **Finalize concretization of value model**
After going through all steps successfully, the concretization of the value model can be accepted by all organizations in the network. At this point all organizations should be confident that the service-dominant business model is financially viable for them. Accordingly, the network can start working on implementing the business model design.
Chapter 6

Evaluation

In this chapter an overview of the last step of our research process, shown in figure 3, is given. In the evaluation phase requirement four of section 3.2 should be answered, namely is our method understandable and usable for the user. Moreover, we try to answer the question if the technique is valid based on the other requirements set for the method. First, in section 6.1 we give an overview of the evaluation process. Thereafter, in section 6.2 we give a summary of the understandability and usability of the method. Thereafter, the validity of the method is discussed and finally we give some improvements for the proposed method.

6.1 Overview of evaluation process

To evaluate the proposed method in this thesis semi-structured interviews were conducted. This section gives an overview of the process that was followed for the semi-structured interviews. The semi-structured interviews were done with three experts from the case company. The demographics of the industry experts are described in table 6.1.

Table 6.1: Demographics of industry experts

<table>
<thead>
<tr>
<th>Experts</th>
<th>Role</th>
<th>Tenure</th>
<th>Business modelling experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert 1</td>
<td>Project manager solution transformation</td>
<td>4-7 years</td>
<td>Knowledgeable</td>
</tr>
<tr>
<td>Expert 2</td>
<td>Director services and solutions delivery</td>
<td>More than 10 years</td>
<td>Knowledgeable</td>
</tr>
<tr>
<td>Expert 3</td>
<td>Solutions business category leader</td>
<td>More than 10 years</td>
<td>Very knowledgeable</td>
</tr>
</tbody>
</table>

All interviewed experts are involved in transformation of the case company towards service-dominant business models, which makes them relevant for our method evaluation. Moreover, they all have quite extensive experience in business modeling, which again supports the validity and relevance of the feedback. We followed the following structure during those meetings:
1. **Introduction on service-dominant business modeling (10 minutes)**
   
   We started to introduce the topic of service-dominant business modeling, to have a general understanding of the topic we were going to address.

2. **Explain proposed thesis method (15 minutes)**
   
   At this point we discussed the proposed method with all its included steps, such that participants were able to understand the different outputs of the method.

3. **Demonstration of case scenario (25 minutes)**
   
   We showed a demonstration of the method based on the case scenario at the case company. The demonstration was concluded by showing the filled in supporting Excel tool of the method. Participants were free to ask questions at any point, although most discussion was after the demonstration.

4. **Discussion on proposed method and case scenario (30 minutes)**
   
   After the demonstration of our method the discussion started with respect to the utility and validity of our method. Also, participants were allowed to ask for clarification of anything they desired.

5. **Evaluation questionnaire (10 minutes)**
   
   Finally, after the meeting a short questionnaire was sent to the participants to give their final input for the evaluation.

For the discussion we focus on the utility and validity of the method under the described circumstances. The questions asked in the method are based on the questions of the questionnaire which is filled in after the discussion, the questionnaire is shown in table B.1. In appendix B the questionnaire can be found and in appendix C the transcripts of the discussions can be found. The results of these evaluation meetings are discussed in the following sections.

### 6.2 Evaluation of utility of method

For the evaluation of the utility, the semi-structured interviews are structure by using a set of question created from the Technology Acceptance Model (TAM) (Davis et al., 1989). According to Moody (2003) the TAM is used to evaluate the acceptance of information systems methods and models. Accordingly, as we require to understand if our method is accepted, the TAM would fit. Within the method a survey is used to evaluate upon three main perspectives (Davis, 1989):

- Perceived usefulness: the extent to which the user believes that using the method improves the designed process
- Perceived ease of use: the extent to which the user believes that using the method is effortless
- Intention to use: the extent to which the user intents to use the method
Each of these aspects is operationalized with multiple questions from the TAM, which are slightly adapted to make them applicable for this research, these are shown in table 6.2. The industry experts had to evaluate each statement on the five-point Likert scale, which ranges from 1 (strongly disagree) to 5 (strongly agree). As explained, apart from these questions a discussion has been after the demonstration of the method, to have more in-depth feedback. These discussions were recorded and the transcripts of the discussions are listed in appendix C. We used the content analysis of Krippendorff (2018) to search for relevant conclusions regarding our method its utility and validity.

Table 6.2: User acceptance results

<table>
<thead>
<tr>
<th>Nr</th>
<th>Question</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I think this method helps to support the financial evaluation of service-dominant business models in a corporate setting</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>4.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>This method would enable me to derive and quantitatively analyse a cost-benefit model from a service-dominant business model for the complete organization</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>4.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Overall, I think this method provides an effective solution in supporting financial evaluation service-dominant business models in a corporate setting</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>4.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Using this method would make it more difficult to derive a cost-benefit analysis for a service-dominant business model in a corporate setting</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>4.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I found the guidelines for applying the method complex and difficult to understand.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>3.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Learning to use this way of financially evaluation service-dominant business models would be easy for me</td>
<td>X</td>
<td></td>
<td>X</td>
<td>3.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Overall, I found this way of financial evaluating service-dominant business with multiple organization and business units difficult to use.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>3.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>It would be easy for me to derive a cost-benefit analysis from a service-dominant business model using this method</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>3.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I would use this method to support financial evaluation of service-dominant Business models in a corporate setting</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>4.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I would intend to use this method to financially evaluate service-dominant business models in a corporate setting in preference to another evaluation method</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>4.67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The items marked with a * have a negative form, and the results are reversed in the graph.

**Perceived usefulness**

From both the interviews and the questionnaire we can conclude that the experts agree on perceived usefulness of our method. According to them our method gives a systematic approach to do the financial evaluation of service-dominant business models in a corporate organization. For example interviewee 3 said: "A strong point of your method is that it looks at the business integrally, which should be obvious but in reality is perceived quite difficult" and interviewee 1 said: "The strong point is that the method looks very broad, it looks at all business with their costs and benefits and takes into account the collaborations". Additionally, interviewee 2 stated that: "The method shows sharply what costs and benefits are exchanged between different actors for a certain value proposition". From this we can conclude that the method is perceived useful.

Moreover, the experts state that its very useful to have the information sharing levels in the method. This is not only perceived useful for information sharing between organizations but also between business units within an organization. For example interviewee 2 said: "What also helps is the information structuring such that you can deal with sensible information between organizations". One addition that is perceived useful by the experts is that whenever the relations between the organizations are not based on contracts some additional calculations could be done by the tool. In these circumstances the value proposition has more underlying uncertainty. Interviewee 1 said: "What you could do is add some scenario's, so what happens if the amounts are uncertain with certain percentages".
Perceived ease of use
With regards to the perceived ease of use, the experts think the method is rather complex to understand upfront. For example interviewee 1 said: "I think the flow of your method is logical, however I found the conceptual models rather difficult to understand, but after an explanation it was understandable" and interviewee 3 said: "The method has a logical story, however due to the level of abstraction its rather difficult to find the logic. I am wondering if without any extra information anyone could understand it. That does not change that story is logical, because it is". Concluding that we should help the intended users to use the proposed method. Moreover, experts think that it is yet difficult to scale the method, as it enables all users today to make changes in the Excel tool. For example interviewee 1 said: "In the end to make this applicable on a large scale it should be a bit more user friendly than Excel. Because you cannot risk that anyone can make changes, which happens a lot in practice." When anyone can change anything in the model, it is rather difficult to know if the information is still valid. Finally, considering the output of the questionnaire our method’s perceived ease of use is above average. From this we conclude that the method its perceived ease of use is okay, but it could be improved with certain additions.

Intention to use
With respect to the intention to use of our method we see from the questionnaire a positive response. All experts where enthusiastic of using the method if circumstances were there and definitely would use the reasoning and structure going forward. During the discussions some intentions came across, for example interviewee 2 said: "If you would look at deal level, then I think this could be very well help to make the right decision regarding accepting a deal" and interviewee 3 said: "I think I would apply it in practice as it gives a good basis to think about doing another way of business, another way to look at your profit and loss statement integrally”. From both inputs we conclude that the experts intend to use our method.

6.3 Evaluation of validity of method

The validity of the proposed method is evaluated by identifying if the results of the case scenario are in line with both reality and the requirements set. To evaluate the validity we use requirement 1 to 3.

In requirement 1 we stated that: "The method should facilitate the corporate organization to quantitatively evaluate the value model of a service-dominant business model”. According to Morris et al. (2005), the underlying revenue model of a business model serves as the continuation driver of the business model design. Moreover, Morris et al. (2005) said that the revenue model analysis should give an understanding of the viability of a business model. Considering the demonstration of our method, the first requirements is fulfilled. By using step 1 and 2 of our method the financial viability for the corporate organization in the network can be analyzed and this result is considered as the main driver for the business model continuation. Looking at the semi-structured interviews conducted at the case company, all interviewees considered our method as a good tool to evaluate the relevant costs and benefits for the organization. For example interviewee 2 said: "this method correctly shows what costs and benefits are exchanged within the network while considering a certain value proposition. If all these costs and benefits are correctly shared with the network, the business model can
The second requirement set for the proposed method is: *The method should support the decision making process of business units to negotiate and concretize the revenue model of a service-dominant business model within a corporate organization*, meaning that our method not only should give the viability for a corporate organization but also for their business units. Again, considering the demonstration of our method we showed that the method considers not only the organization itself but also the business units its build upon. These business units have their own goals and objectives to collaborate in such deals, obviously these goals are connected to the organizational goals. Using our method, for both the business unit level and the organizational level (figure 2.9) the value model is considered in the concretization and analysis (figure 4.5). Also, during the semi-structured interviews, that we did as evaluation of our method, all participants stated that a strong point from our method was that we considered all actors within an organization as well. For example interviewee 3 said: *The advantage of the method is that is looks at the business integral, what should be obvious, however is quite difficult in practice*. This means that you should not only look at the complete organization but at all components to perform well in business and that we support that thought process. Therefore, the set requirements is full filled.

The third and last requirements for evaluation of the validity is: *The method steps should be grounded on the axioms of service-dominant logic*. In table 2.1 the axioms of service-dominant logic are stated. This method uses as its basis the service-dominant business model radar of Turetken and Grefen (2017), which is based upon the listed axioms, therefore we can conclude that our method full fills the axioms as well. However, one additional change is made to the use of the service-dominant business model radar as we consider next to the organization also its business units. Considering the axioms for all different underlying business units, the first axiom, *service is the fundamental basis of exchange*, will not always hold. A business unit could deliver just a product to the entire network while the complete organization together delivers a service. This does not have implications, as the axiom still holds for the organization.

### 6.4 Improvement directions for method and Excel tool

During the evaluation several directions for improvement were identified, both through analysis of the results and by interviewing the experts in the field. In this section we will discuss each of those improvement directions in detail.

First, our literature study found that the Net Present Value (NPV), formula 2.3, has the disadvantage to ignore risk (Brookfield, 1995). The future cash flows are assumed to be right for the complete time span of the project, while this does not have to be true is all cases. For our case scenario this is not yet a problem, as the volumes of products and services exchanged are based upon contracts. However, when considering business models not based on contracts or at least with some uncertainty upon the amount of goods and services delivered, the calculations of the NPV could be misleading. Moreover, the first interviewee mentioned the risk of calculating an outcome for a case with uncertainty, which shows up when considering flexible revenue models as pay per use. For further improvement of our method, we should investigate on other outcome measures, which are less risk ignorant, that could be used in
situations with more risks. Furthermore, to improve the Excel tool, worst case and best case scenario could be calculated when dealing with uncertainty in demand of goods and services.

Secondly, from the questionnaire and the discussions we concluded that the method is rather complex. Experts explained that the level of abstraction in the method made it difficult to understand. However, after explaining the required steps to take in the method and providing them with a demonstration of the method, it was perceived less difficult. To make our method easier applicable in practice we should give extra guidance in how to perform all steps. We could either take more time explaining the method or change the method to be more understandable. Moreover, extra applications of our method should be done, which could be used as an example for other users in practice.

Lastly, during both analysis of results and the interviews it was found that the data integrity of the Excel tool is not yet sufficient. Wiegers and Beatty (2013) stated that system integrity is an important aspect and formulated integrity as, ”the extent to which the system protects against data inaccuracy and loss”. During the evaluation interviews it came across that this tool would work on a small scale with not too many people involved. However, when the tool would be used on a bigger scale with more people using it to calculate the viability of the business model on a deal level, the data integrity should be consistent. At this point each user of the tool can change and modify the data and even the functions calculating the outcome, resulting in a tool that could not be used on a bigger scale. Moreover, different organizations can see all values at different levels which should, according to our proposed method, not be visible to them. To conclude, the Excel tool could not yet be used in practice without some disadvantages, to overcome these the tool requires different user types. In that way we could show users only relevant information and we could allow only some users to make changes to the data and function in the tool.
Chapter 7

Conclusion

In the introduction of this thesis we elaborated that organizations are shifting from goods dominant logic towards service dominant logic. Due to increasing competition and shifting customer desires towards solutions satisfying their needs, organizations are required to change (Kowalkowski et al., 2017). Yet new business models are developed to enable the shift towards service-dominant logic. As these new service-dominant business models are implemented in practice, there is a need for evaluation of these methods (Turetken et al., 2019). According to Krumeich et al. (2012) financial evaluation of new business models is very important. Some financial evaluation methods are known already in literature addressing the need of a structured evaluation approach. However, none of these methods take into account the underlying business units of the organizations participating in the service-dominant business models, while Auffrey (2007) mentioned that different problems arise taking into account the business units of a corporate organization. Therefore, the goal of this research was to develop a method supporting the financial evaluations of service-dominant business models in a corporate setting, taking into account the several business units. We aimed on developing a systematic method, to support corporate organizations in financially evaluating the viability of service-dominant business models, where both business units and other organizations collaborate in a network.

As a basis of our method we took the service-dominant business model radar and slightly adapted that to our case, enabling business units to take part in the collaboration. From that we required a method step visualizing the exchanges between the actors in the network, to enable the cost-benefit calculations. Not all information could be shared between all parties in the network, as information could be sensible for the participating organizations. In our method we use four different levels of information sharing to overcome the difficulty of sharing sensitive information. Consequently, we can translate all cost and benefit information into parameters of the different information sharing levels. Moreover, considering the cost and benefits, we developed a concretization process supporting actors in the network to collaboratively set parameter values and how they can explore mutual beneficial parameter settings. To further support the method, we developed an Excel tool allowing users to analyse their scenario’s in a structured way.

Finally, we used a real-life case scenario to apply our method to. Together with experts from the case company we evaluated the proposed method. We did semi-structured interviews with
three experts from the case company, and we also asked them to fill in a questionnaire. We evaluated our method with regards to both utility and validity. In general, we can conclude that the perceived usefulness and intention to use was high. However, the conceptual method is considered to be rather complex, resulting in a slightly lower perceived ease of use. In respect to the last point we should guide our users through the application process by giving best practice and extra application guidelines.

7.1 Contributions to research

In the conclusion we elaborated that due to the shift to service-dominant business models also new evaluation methods were required (Turetken et al., 2019). In previous research of Gilsing (2020), already a financial evaluation method (INEM) was created, which is described in section 2.4.2. This method only considered complete organizations and did not yet consider the different business units within an organization. However, we found in literature the desire for an extended version of the existing method. During the evaluation of INEM it was found that a method supporting internal alignment of business units within organizations would be valuable as well, while being active in a collaboration network. Moreover, we found that collaborations between business units could deliver extra economic value for both the organizations and the business units (Bowman & Helfat, 2001). Considering the INEM method, the user can put the different business units as different actors in the model. However, the collaborations between the business units is adding the most value for the corporate organization, as it enables them to leverage higher margin business units over market shares of other business units. This requires business units to be specified separately in the financial evaluation, while being within the same organization to leverage the opportunities. Therefore the method of Gilsing (2020) is not yet applicable in practice for corporate organizations. Consequently, this research created an extended version of the method started by Gilsing (2020).

With the extended version of the method we addressed to the need enabling corporate organizations to financially evaluate the viability of service-dominant business models. By using our method, a systematic support process is designed to analyse if a proposed service-dominant business model design is viable for the different business units but more importantly for the corporate organization itself as well. In earlier literature it was already found that collaborations between business units resulted in extra economic value, however in literature for SDBM there was no financial evaluation support method yet to leverage this opportunity. Using our method, literature can understand the extra opportunities for corporate organizations working in network of both their business units and other organizations.

Not all actors want to share all information with all actors in the network, when considering service-dominant business models (Flint & Mentzer, 2006). Reypens et al. (2016) and Gilsing, Turetken, Ozkan, Adali, et al. (2020) already proposed in literature to use three levels of concern; the public level, restricted level and private level. In this research we proposed to split the private level into two; organizational level and business unit level. As most corporate organizations are yet build out of many business units with their own objectives, it is not yet possible to assume that collaborative business units are only analyzed on organizational level, as they require to deliver upon their own targets. Collaborations between business units can
grow economic value for the organization, which makes it important to enable assessment of both the standalone business unit objectives and the corporate organization over coupling objectives. Taking this perspective as a basis, it enables researchers to investigate in more detail how co-created value is exchanged, between organization and their underlying business units, in service-dominant business models.

7.2 Contributions to practice

Most importantly our method can help corporate organizations to support financial viability evaluation of new service-dominant business models. The structured process we proposed can help the network to make decisions on the viability of the desired service-dominant business model blueprint. With our method the corporate organization can understand the extra economic value delivery of collaborations between business units and other organizations. Using this method they can understand the impact of different margins at products and services and what the impact could be of gaining extra market share for a highly profitable business unit. Also, the developed Excel tool can provide further support for corporate organizations to do cost-benefit analyses on both business unit and organizations level. The Excel tool can make the costs and benefits exchanged through the network explicit and help negotiate on the desired parameter values for which different actors within and outside the organization have opposing preferences.

Moreover, our method can contribute not only in helping them calculate the correct outcomes to understand if a deal is viable for the company and the different business units, our method also helps them during the transformation of the corporate organizations. It requires a big shift in thinking for all employees, which is by definition a very difficult part in the transformation process. By making explicit the extra earning that can be gained by collaborating with other business units, we can contribute in convincing key players in the organization. During one of the interviews an interviewee said: "This method helps the shift in thinking as we require them to think in Customer first, Company second and Businesses third", concluding that our method could help in this process.

7.3 Limitations and future research

Our research faces several limitations, in this section the most important limitations and opportunities for future research are addressed. The first limitation is the limited applications of our method. Only a limited number of stakeholders were able to evaluate the method for its utility and validity, which could be improved by additional applications. However, the first demonstration of our method indicated a positive attitude towards the proposed method and the likelihood of usage in practice. Finally, to support this preliminary conclusion on the method’s utility and validity, it should be used in more cases.

We mentioned that to make a better conclusion on the method’s utility and validity, more case studies have to be conducted. In our case scenario, we analyzed a scenario on a single deal level. However, the method could be applicable on business case level as well. During one of the interviews the following was mentioned: "An advantage I see is that the method
could also be used at business case or total proposition level, which makes it applicable at two
different layers”. To enable such analysis as well, possibly some changes have to be made. For
future research, it would be interesting to use our method on business case level as well and
understand if the method requires some additional changes to enable these type of analysis.

During the evaluation of our method, some additional future research opportunities were
found. First, when the exchanges in the network are not based on contracts and some un-
certainty comes into the model in the amounts of goods and services delivered, resulting in
a less reliable NPV. The NPV is highly influenced by changes in the future cash flows, if
these are uncertain, the NPV becomes less reliable as well. This uncertainty will result in
more difficult negotiations regarding restricted parameters, as we cannot give certain values
for future cash flows. Finally, the values for restricted parameters can be rejected as due to
uncertainty the parameter values become too high. To tackle this problem, we have found two
topics for further research. First, as discussed during one of the interviews, it could be inter-
esting to investigate under which circumstances no contract is required, while being certain
that the customer buys all goods and services from the network. For example, when the cus-
tomer already bought something from the network, which was highly expensive, the network
could be quite confident that the customer buys the compatible products and services from
them as well. Finally, the uncertainty in the future cash flow can be brought to a minimum
level and the NPV will be more reliable again. Secondly, another interesting topic of future
research could be the use of real options. Stapleton et al. (2014) argued that when using
discounted cash flows to value a product, you implicitly assume that the firms do not change
the project. However, when project outcomes are uncertain, real options can clearly add
value to project outcomes and uncertainty. When uncertainty comes into a service-dominant
business model, real options can possibly be used to evaluate the value model, which should
be further investigated in future research.

Lastly, it could be interesting to investigate if the method could go towards supporting value-
based pricing. Currently, the proposed method looks at service-dominant business value
propo tio and translates that in a value capture diagram. The value capture diagram is then
used to calculate, if under current circumstances, the business model design would be viable.
In the case scenario we based our pricing strategy on costs and benefits for the organization
itself, however it could be based on the outcome for the customer. It could be interesting to
understand if prices can be set higher, when extra customer value is created by delivering the
propo of the network. Also, during one of the evaluation interviews, an improvement
aspect was that our method does not sufficiently enough address the added customer value
when considering the pricing negotiations. The results of the evaluation showed that it would
be interesting to see the method supporting customer value-based pricing as well. To do this,
added customer value should be analyzed and based on that the pricing negotiations should
be done in the method. For future research and development on our method, it would be
interesting to investigate how to incorporate value-based pricing in these type of models.
Bibliography


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Appendix A

Finance used for method

In this appendix we try to give a brief description on how certain prices used in the case scenario are calculated. Note that we do not use exact prices, as it is sensible information for the case company. We will also not go over every price used in our method, we will take the equipment as an example. First, equipment would be sold regardless of the other products and it would be sold on capital expenses, meaning that the customer just paid the price. In the case scenario the equipment is delivered as a service to enable the customer doing their treatments, while paying a fixed fee for a fixed amount of years. This requires us to calculate the periodic fee, instead of just the selling price. Moreover, we require to have the total costs for the equipment as well to enable the calculation of both the NPV and the payback period.

First, we have to calculate the period fee that must be paid. To do this a world reference price for a specific market is chosen with the normal discount. This results in the price we take into account as starting point for our calculations. Then we have to take into account that we take the equipment back after the contract duration, which results in a residual value for the equipment. Lastly, we should take in mind that money today is worth more than money later in the contract, resulting in using a discount factor to deal with this. As discount factor we take the WACC, which is always used at the case company. Finally, after taking into account the world reference price, the discount, the residual value and the WACC we can calculate the periodic fee for the customer.

Secondly, must understand our costs to enable the calculation of the financial measures. The total costs are build out of several cost components, which we try to describe here. However, also we cannot give any sensible information, as for that reason we describe the reasoning high level. Firstly, we have to take into account the industry costs of sales, containing for example the production costs. Thereafter, market costs of sales is considered, which we used as well in our case scenario and is therefore not contained in the total fixed costs as we do not want to use it twice. Other costs factors to take into account are RD fee, market sellex and central sellex. Finally, we end up with the earnings before interest and tax (EBIT), where we substract the required taxes from. Finally, from this we can calculate the total required costs and therefore the NPV and payback period. To conclude, in the model we only used transformed values for these calculation, however doing the case scenario we took into account all the different aspects.
## Appendix B

### Questionnaire method evaluation

<table>
<thead>
<tr>
<th>Nr</th>
<th>Question</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I think this method helps to support the financial evaluation of service-dominant business models in a corporate setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>This method would enable me to derive and quantitatively analyse a cost-benefit model from a service-dominant business model for the complete organisation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Overall, I think this method provides an effective solution in supporting financial evaluation service-dominant business models in a corporate setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Using this method would make it more difficult to derive a cost-benefit analysis for a service-dominant business model in a corporate setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I found the guidelines for applying the method complex and difficult to understand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Learning to use this way of financially evaluation service-dominant business models would be easy for me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Overall, I found this way of financial evaluating service-dominant business with multiple organisation and business units difficult to use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>It would be easy for me to derive a cost-benefit analysis from a service-dominant business model using this method</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I would use this method to support financial evaluation of service-dominant Business models in a corporate setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I would intend to use this method to financially evaluate service-dominant business models in a corporate setting in preference to another evaluation method</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table B.1: Questionnaire for evaluation of method
Appendix C

Interviews transcripts

C.1 Transcript 1

Interviewer
Wat vond je van de methode?

Interviewde
Ik vond het een logisch en goed opgebouwd verhaal. Goed dat je naar verschillende niveaus kijkt en de informatie uitwisselingen op deze niveaus gaat en hoe dat wordt vertaald naar een model. Het kan wel schelen dat ik erg in deze hoek van denken zit, dus voor mij is het als het klopt al snel een logisch verhaal. Ik vond de flow hoe je het uitlegde logisch, wel vond ik het lastig om het conceptuele stuk te begrijpen, maar na de uitleg was het erg goed te begrijpen. Ik heb ook niet het idee dat je echt wat heel belangrijks hebt gemist, je hebt erg goed de verschillende aspecten meegenomen.

Interviewer
Kloppen de stappen ook met de realiteit?

Interviewde
Ja zeker, als je de voorbeelden geeft komt dit erg over met werk waar ik mee bezig ben. Het hele conceptuele verhaal is dat lastiger uit te halen maar met voorbeelden denk ik dat je een goede basis hebt neergelegd. Maar als je dit goed kan uitleggen, kan het zeker bruikbaar zijn. Zodra ik de ingevulde versie zag, nu snap ik hoe de conceptuele versie werkt.

Interviewer
Wat zijn volgens jou de sterke en zwakke punten van de methode?

Interviewde
Het sterke punt is dat je heel breed hebt gekeken, dus dat je inderdaad nastreeft dat je naar meerdere business kijkt en daarbij alle kosten en benefits in acht neemt en hoe deze samenwerken. Maar ook, wat zijn kosten die uit andere hoeken komen. Dus dat gaf een goed geheel beeld van het hele plaatje in zo’n business model. Daarbij was het Excel model ook goed te volgen, en dat was sterk om het mee te ondersteunen. Een verbeter punt, dat kan ik op dit moment niet bedenken.
**APPENDIX C. INTERVIEWS TRANSCRIPTS**

**Interviewer**
Is de methode makkelijk toe te passen en makkelijk te leren?

**Interviewde**
Dat lijkt me wel, uiteindelijk als je dit op grote schaal zou willen doen moet het iets gebruiksvriendelijker zijn dan Excel. Omdat je anders het risico loopt dat mensen zelf dingen gaan veranderen, wat we in de praktijk erg vaak ziet gebeuren. Maar als je de integrale deal wil berekenen op een goede manier en een redelijk simpele manier, gaat dit zeker helpen. Het is dus een goede balans tussen bepaalde inzichten die je geeft tussen welke afwegingen je moet maken voor een goede deal, en daarvoor is het een hele bruikbare tool.

**Interviewer**
Zou je nog wat toevoegen aan de methode?

**Interviewde**
Dus inderdaad het gebruik van een Excel met alle mogelijkheid voor mensen om aanpassingen te maken zou ik veranderen. Wat je nog zou kunnen doen is om een aantal scenario’s toe te voegen, dus voor je what-if analysis laten zien wat er zou gebeuren als de getallen afwijken met bepaalde percentages. Hierbij zou je de risico’s dus wat makkelijker kunnen managen. Maar wanneer dit contractueel vast zal liggen maakt dat niets uit, maar denkend aan andere business modellen kan dit helpen.

**Interviewer**
Bedankt

**C.2 Transcript 2**

**Interviewer**
Wat zijn de sterke en zwakke punten van de methode?

**Interviewde**
Aan de ene kant zie ik een goede start om een model te hebben wat de rol tussen de verschillende actoren heel scherp neerzet. En daarbij ook scherp laat zien wat de opbrengsten en kosten en de verdeling van de financiële benefits zijn voor verschillende partijen voor een bepaalde value propositie. Ik zie ook dat het model wat daaruit voorkomt wellicht op business case niveau en totaal propositie gebruikt kan worden, dus ik zie twee toepasbare lagen voor het model. Wat ook helpt is de informatiestructurering zodat je met de gevoeligheden en privacy van actoren goed om kunt gaan. Wat er denk ik mist, of wat voor mij een nadeel is, is dat er niet gekeken wordt naar hoe je de value voor de klant vergroot en dat de taart voor alle deelnemers op die manier groter wordt. We gaan hierbij uit van bestaande kosten en prijzen, maar de echte bijdrage om de value voor iedereen te vergroten en daarbij pricing anders te doen neem je hier niet mee. En dus is het wellicht interessant om de propositie te verbeteren.

**Interviewer**
Wat voor informatie missen we dan?

**Interviewde**

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A method for evaluating service-dominant business models in a corporate setting
Ik denk dat je vooral moet begrijpen wat de belangrijkste drivers zijn bij de klant om te bepalen of iets value is of niet. Daarbij kan je denken aan parameters over workflow efficiency en efficiency van inzetten van assets. Op het moment dat je oplossing hier een verbetering in brengt en je dit kunt kwantificeren en financieel maken dan denk ik dat je op die manier kunt overwegen of je de taart voor de actoren allemaal groter kunt maken. De klant omdat hij meer gemotiveerd zal zijn om de oplossing toe te passen en dus meer waarde, maar ook voor de partijen die bijdragen aan de oplossing.

Interviewer
Denk je dat het makkelijk is om deze methode toe te passen in de praktijk?

Interviewde
Toepasbaar heeft wat mij betreft twee dimensies. Toepasbaar in de zin dat men begrijpt hoe het werkt en daar beslissingen op kan nemen, daarbij denk ik dat het zo is. Als je het gaat vertalen naar de grote van de organisatie die de case company is en hoe je dat zou moeten scalen in de bestaande procedures, tools, IT-oplossingen daar zit denk ik nog een hele grote uitdaging. En dat heeft meer te maken met de infrastructuur en historie van ons bedrijf en het feit dat dit een stap is in de transformatie die wij doen. Hier ligt voor ons nog flink werk als bedrijf om die stappen te maken, een grote verandering op de back-bone infrastructuur hoort daarbij. Dit geeft daarbij natuurlijk ook erg goed richting om de kant te kiezen waar we naartoe moeten.

Interviewer
Zou je dit model gebruiken als je in een dergelijk soort situatie terecht komt?

Interviewde
Als je het op deal-niveau bekijkt, dan denk ik dat dit zou kunnen helpen om voor de case company de juiste beslissing te maken door wel of niet de deal te accepteren. Dit geeft een andere kijk op de vraag of is dit zinvol of niet. Kan ik dit doen, dat je het kan schalen naar de vele sales mensen in de markt dan is dat daar nog niet genoeg fool proof voor. Je moet hier nog steeds met veel verstand en kennis van zaken naar het model kijken. Het is nog niet op het niveau dat je het kan operationaliseren en schalen.

Interviewer
Heb jij nog een vraag?

Interviewde
Nee het was helder, bedankt ik ga hier zeker eens naar kijken

Interviewer
Bedankt

C.3 Transcript 3

Interviewer
Wat vind je van de methode die we gemaakt hebben?

Interviewde
Het is een logisch verhaal aangegeven het abstractieniveau blijft het wel moeilijk om de
logica eruit af te leiden. Ik vraag me af of je zonder de voorkennis die ik heb, of het voor iedereen te volgen is. Dat doet niks aan af aan of het verhaal logisch is, het is logisch. Hoe het gebracht wordt, je moet behoorlijk wat horsepower hebben om dat in een keer te begrijpen.

**Interviewer**
Wat zijn de de sterke en zwakke punten van de methode?

**Interviewde**
Het sterke punt is dat het naar een business integraal kijkt, wat je zou denken dat moet altijd zo gebeuren maar in de realiteit in een groot bedrijf is dat moeilijk omdat iedereen een deel verantwoordelijkheid heeft. Het is helemaal in lijn met de kreet customers first, case company second and businesses third. Dat is het model wat dit probeert dus dat is sterkte, de zwakte ervan is dat het een enorm stakeholderveld met losse puzzelstukken is die je allemaal moet meekrijgen, want men moet ook wel degelijk willen handelen in case company second, business third. En dat maakt het dus lastig vanuit een stakeholder management. Het vraagt een behoorlijk culturele shift in thinking.

**Interviewer**
Wat zou er dan in het model aangepast moeten worden?

**Interviewde**
Een uitleg komt What’s in It For Me van de individuele deelblokjes mensen, hoe krijgt diegene die kortingen gaan geven of minder marge gaan krijgen what is in it for them.

**Interviewer**
Eigenlijk zou dat in die radar eruit moeten komen, wat ze uit het business model halen. En als je naar geld kijkt proberen we dat daarna te vertalen naar of een business model goed is voor alle stakeholders of niet. Maar ik begrijp dat dit een transformatie vergt voor de organisatie.

**Interviewde**
Dat ligt niet aan het model maar ik denk dat dat een niet niet te onderschatten implementatie obstakel is. En het zou misschien goed zijn om die in het begin te benoemen of ergens benoemen. Jij doet niet aan psychologie of aan organisatie design, je hebt een model. Maar ik denk dat het goed is om duidelijk te maken dat het model zeer theoretisch zal blijven als niet een heel een aantal andere mensen grondig meegenomen worden in de implementatie van dit soort modellen. Dit implementeren in een klassieke business, een holding structuur, wat de meeste grote bedrijven hebben, maakt het heel lastig. Als je in een operating bedrijf kijkt, is dit minder lastig. Dan kan de grote baas zeggen wat er moet gebeuren. Maar wij zitten nu halverwege tussen een holding en operating company en dat maakt het lastig. In een holding company heb je dus separate targets maar in een operating company niet. Op het moment dat er maar op een plaats een profit en loss statement wordt berekend is dit logisch, maar omdat we vroeger een holding waren, en voor een groot deel nog steeds zijn in onze profit en loss statement opbouw, is dit lastig. Dat is de zwakte van het model, wat niet ligt aan het model, maar het wel erg lastig maakt.

**Interviewer**
Denk je dat het model bruikbaar is in de praktijk, afgezien van de implementatie problemen?
Interviewde
Ja dat denk ik wel. Ik denk dat dit model een hele goede basis heeft om na te denken en te kijken hoe je in de praktijk een andere bedrijfsvoering, een andere manier om naar je integrale PL te kijken geeft. Ik denk zelfs, ik vraag me af of, een bedrijf als HP, niet gewoon dit soort modellen daarvoor gebruiken. Uiteindelijk geef je de printers tegen bijna kostenniveau weg omdat je je winst maakt op de inkt, oftewel je moet zo veel mogelijk printers in het veld krijgen. Uiteindelijk is het dat model, maar dan veel ingewikkelder omdat je in dit soort modellen veel meer dan inkt gaat verkopen. Uiteindelijk is het dus bruikbaar ja. Maar omdat het eerst ging om maar alleen hardware of consumable los, ben je hier aan het kijken om dat naar een nieuw en beter niveau te trekken.

Interviewer
Heb je nog vragen of opmerkingen die ik mee zou moeten nemen?

Interviewde
Ik denk dat het verhaal presenteren nog lastig kan zijn, ik denk dat zelfs in een academische setting, een concreet voorbeeld heel simpel kunt uitwerken omdat je dan heel snel mensen mee krijgt. Ik denk dat je in een paar minuten een aha moment kunt creeren waarmee je heel je audience meekrijgt. En hierbij pak je equipment en onderhoud, of gewoon het HP model, wat iedereen kent. Dan kan je uitleggen waarom je die printers tegen een lage prijs krijgt om daarna meer te kunnen verdienen. Dan zeg je, dat is dat model dat we op een veel grotere schaal zijn gaan uitwerken. Als een ziekenhuis een scanner hebben, en ze hebben software nodig om dit te gebruiken. Maar ze hebben eerst veel geld uitgegeven om de kamer in te richten, dan willen ze daarna de software ook, en de vraag is dan of je dat contractueel moet regelen. Ze hebben dan geen alternatief meer om die software ook te kopen, omdat ze net veel geld hebben uitgegeven. Dus het zou interessant zijn ook nog om te onderzoeken wat je aan voorwaarden moet creeren om het niet contractueel vast te hoeven leggen. Dit werkt bij HP omdat mensen maar weinig ruimte in het huis hebben, dus als je eenmaal een printer hebt van HP, ga je die toch wel gebruiken. Het zou interessant zijn als dat door te trekken is in dit soort modellen. Je moet hierbij wel veel vertrouwen hebben in onze markt, want als het mis gaat is het wel duur.

Interviewer
Bedankt