Theoretical Deduction of Value Potentials of Service-based Business Models

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Responding to the shift towards a service society an increasing number of manufacturing industries recognize the competitive advantage of the service business and integrate advanced services into their traditional product dominated portfolio. Despite the valuable research done in the field of advanced services in manufacturing industry, a stable and consistent theory offering explanations why this strategy of service orientation should lead to economical, ecological and also social benefits is lacking. This paper presents an approach for identifying what kind of value based on theoretical arguments could be generated through service-oriented business models.

1. Introduction

Corresponding to the ongoing change of society and technology companies have to consistently adjust their strategy in order to cope with newly arising challenges and to exploit emerging opportunities. Responding to the shift towards a service society an increasing number of manufacturing industries recognize the competitive advantage of the service business and integrate advanced service into their traditional product dominated portfolio. Characteristic for a service-oriented manufacturer is the integrated offer of product and services aiming to increase the value in use as output for the customer (Baines et al., 2007). The bundle consisting of a product and service components thus, aims for the elementary need of customers to take advantage of the functionality of a product which was in the traditional model tied to the property of the physical good.

Especially within the last decade the service orientation in traditional product-oriented industries attracts more and more the attention of researchers from various disciplines (Baines et al, 2009). The increasing scientific debate is predominantly legitimated against the background of the positive impacts on the business performance for the equipment manufacturer coming along with the service orientation. Higher margins, environmental savings or the differentiation factor against low-cost competitors are just some advantageous arguments for service-based business models (SBBM) found in literature. Also customer benefits such as the concentration on core competences (Lay et al., 2007a) are reported as well. The actual application of SBBM in the manufacturing industry however, shows a different picture than that transferred by scientific literature. An analysis of the usage of SBBM by customers in the year 2009 of five different types of SBBM revealed that approximately 25% of the customers in the German manufacturing industry actually apply at least one of these concepts (Schröter et al., 2010). Also observations of the business reality revealed that SBBM are often offered by equipment producers only because customers “force”

them into these offers. A pro-active marketing from the provider side is often neglected as providers do not perceive a value added through these offers. As a result, the perception of SBBM in practice and in scientific discussion is highly contradictory.

In comparison to the mostly case-study dominated work in this field, only a few research approaches dissect the creation of value-added from an economic and an ecological as well as a social perspective. This paucity of previous research, justifies more research attention into (1) why, from a theoretical perspective, value-added within the economic, ecological and social dimension should be created through SBBM and if so, (2) how under real world conditions companies can exploit these surpluses. The paper proposes a research design targeting these two questions, by giving first a short literature review to provide an overview of the variety of benefits assigned to SBBM. In the following section new transaction characteristics of SBBM are identified to provide a rational basis for the explanation of the value-adding potential of SBBM in comparison to the traditional business model. After a short review of existing approaches to theoretically deduce value-adding potential of SBBM, the identified new transaction criteria will be applied as link between theoretical approaches and their applicability to SBBM. The paper continues by hypothesizing on the impact of SBBM on the economic, ecological as well as social value dimension. Whether the hypothesized interdependency actually matches business reality was tested through a set of 10 expert interviews on SBBM. After the results of the explorative analyses are presented the paper concludes with a short outline of the next steps of the proposed research agenda. Figure 1 depicts the proposed research approach.

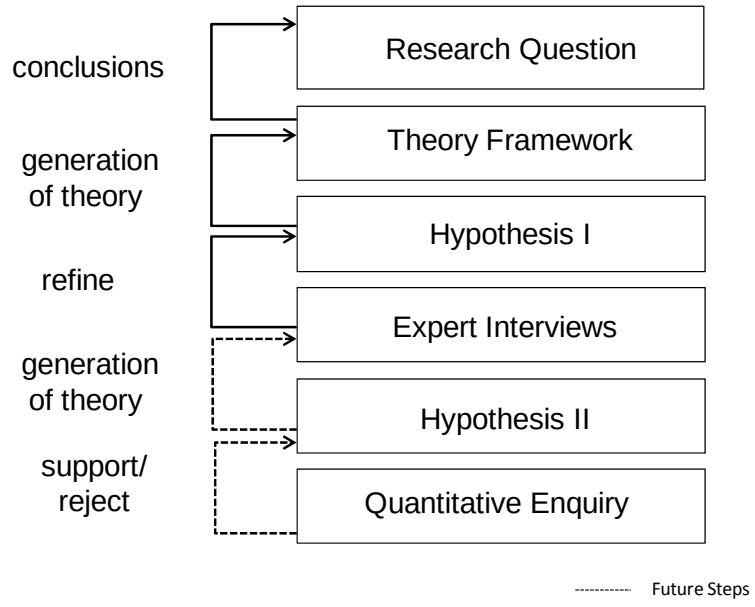

Fig. 1: Research Approach

2. State-of-the-Art in Literature

The success of service orientation observed in some companies, e.g. IBM and Rolls Royce, gave reason to different economic or economic-related research disciplines for further analysis. In the focus of scientific attention have been topics such as marketing of product-service bundles (Grönroos, 2000, Auramo; Ala-Risku 2005, Mathieu 2001), success factors of the transformation process (Wise; Baumgartner, 1999), scope and implementation of organisational change (Oliva; Kallenberg, 2003, Gebauer et al., 2010), pricing and accounting for product-service bundles (Malleret, 2006) and also the technical design of the physical component (Fleischer et al., 2008). Furthermore, SBBM have also been analysed from the view-point of ecological benefits (Mont, 2002; Bartholomeo et al., 2003).

Besides the exposure of the managerial challenges in the course of the interdisciplinary scientific discussion, different sources of value-added potential have been detected as well. Amongst the reported exploitable benefits in connection with SBBM are the possibility of generating higher margins with service offers (Wise; Baumgartner, 1999, VDMA 1998), the balancing of economic cycles through more regularly occurring service profits (Oliva; Kallenberg, 2003) and improving operational efficiency (Auramo et al., 2004). Furthermore increasing customer demand for SBBM is reported (Auramo; Ala-Risku, 2005) as well as the lengthened and intensified customer relationship as the service business do not end after the product is delivered. Also connected with a move downstream are the exploitation of growth opportunities in matured markets (Brax, 2005), securing new orders (Davies 2003), building customer loyalty (Davies, 2003) and the use of services as a differentiation factor (Fischer et al., 2008). Finally, SBBM are seen as a promoter for innovation as well (Davies, 2003). Whereas these benefits apply mostly for the equipment producer, for the customer SBBM can result in a higher quality of the output (Freiling et al., 2001; Lay et al., 2007a), in focusing the concentration on its core competences (Markeset; Kumar 2003) and accounting benefits such as substituting fix costs through variable charges. In addition ecological benefits like higher resource productivity through reduced input (Mont 2002) and an extended or intensified product-life cycle (Scholl; Zundel 1999) are mentioned. Further benefits for the ecology enabled through SBBM are closed material cycles (Mont, 2002) and a decoupling of economic success and resource consumption through the sale of use rather than goods (Stahel, u.d). Furthermore triggered by the intensified customer-provider relationship and the increased labour intensive customer-provider interaction, industrial services can lead to an increase in employment (Scholl, 2000) leading to benefits for the society.

Besides these benefits, which stem mostly from case-study research also quantitative studies captured the phenomenon of service orientation in the manufacturing industry. Gebauer et al. (2005) revealed in their study that more than a third of the surveyed 199 manufacturing companies create above 20% of the revenue through their service business. Actually about 11% of the surveyed companies realize a share of over 40%. On the other side the study provided evidence that nearly 40% of the companies earn 10% or less of their total revenue through services. Bienzeisler and Kunkis (2008) showed in their survey of 140 companies in the mechanical engineering industry that 30% of the companies realized profit margins over 20% with services. But also on the other side of the coin 46% of the companies realize margins of 10% and less. With a special focus on service innovations in the manufacturing

business Lay et al. (2007b) detected that 54% of service revenue, directly and indirectly priced, results from innovative services.

It has to be admitted that the authors of the referenced studies do not rely on perfectly congruent definitions of SBBM in their analyses. Despite this incongruity, the listed findings show consensus in a renunciation of the traditional transactional business logic. This puts emphasis on the “sale of products” and offers industrial services as add-on to facilitate the product sale. The given excerpt of qualitative findings, however, gives an overview of the multitude of possible benefits on SBBM. But it also highlights the “wild” accumulation of benefits arising from putting different perspective on SBBM, e.g. from an economic/ecologic or from a macro/micro point of view. Whereas qualitative case-study research provides sometimes hints on the actual source of value-added the quantitative findings indicate that a successful implementation of SBBM can result in higher revenues or profit margins but leaves open where exactly this value-added stems from. Despite this valuable research, the sources of value-adding potential of SBBM are still untapped. To systematically approach this research gap in the following section differences in the traditional transactional business logic of SBBM are elaborated.

3. Theoretical Framework

3.1. Transaction Characteristics in Service-based Business Models

Although the meaning of product-service bundles and its impact on the provider and customer companies is widely acknowledged, no sharp definition exists. As result of the vivid scientific debate on this phenomenon especially during the last decade, a variety of terms have been coined to capture the trend of service orientation in the manufacturing industry. Lay et al. (2009) give an overview according to the research discipline brought them into being. Amongst these terms are for example “servitization” (Neely, 2008), “Product-Service System” (Tukker, 2004) and “(high value) Integrated Solutions” (Davies, 2003). Existing definitions comprise the listing of key elements and purpose of product-service bundle (see Baines et al., 2007, Neely, 2008). Other more pragmatic approaches work with lists of different types of services (Neely, 2008). A widely acknowledged classification scheme by Tukker (2004) of product-service bundles in scientific literature distinguishes these offers into the following subcategories.

- **Product-oriented services:** sale of product including add-on services
- **Use-oriented services:** selling use or availability of a product
- **Result-oriented services:** selling result or capability instead of a product (Baines et al., 2007)

Value creation in product-oriented services is mainly tied to the ownership of the product. The manufacturing company “creates” value by designing and producing a product. Through the transfer of ownership of the product to the customer it got compensated through the sale price. From that point on the customer as the owner of the

product exploits value through integrating and operating the asset in his/her supply chain network. In this traditional “mode” of transaction industrial services were merely seen as an “add-on” to the product (Gebauer, 2008). Often these industrial services were handled as “give-away” and delivered for free to support the sale of the product (Lay, 2003). Value-creation in the manufacturing industry was thus mainly bound to the ownership of a product. Use-oriented and result-oriented services in contrast characterize more advanced service offers as they unleash this bond of value creation and ownership. Implicit to this uncoupling is the change in the perceived value contribution of industrial services within these two subcategories. Within use-oriented and result-oriented services, the service as integrated part becomes the enabler of value creation triggered by the product, which serves as value carrier. Given this new perception of industrial services as part of the value proposition in use and result oriented services these both sub-categories are considered as basis when referring to SBBM.

However, a business model according to Stähler (2002) and Timmers (2000) contains three dimensions – value proposition, value chain architecture and revenue model. The classification scheme provided by Tukker distinguishes the three types of service-oriented offers according to a roughly defined value proposition. The design of the residual two dimensions of a business model is not determined at all. Therefore, the term service-based business model subsumes a myriad of possible designs of product-service offers selling either use or results. But referring to the decoupling of ownership and value generation, this constitutes the common element of use and result-oriented services and thus will be used as the initial thought guiding further considerations. Bearing this separation in mind the following three new transaction characteristics diverging to the traditional transactional business logic can be derived:

Co-Creation of Value: The emphasis in SBBM is not anymore on the “sale of the product” but on the “sale of use” (Baines et al., 2007). This delivered value in use is the outcome of the bundling of product and services and delivered as a process. In the delivery process both customer and provider play an active part (Fischer et al., 2008; Mathieu, 2001), wherein the customer provides significant input into the production process (Sampson; Froehle, 2006). This implies also that the provider can not autonomously decide upon the planning, execution and quality of the service, but is dependent upon the customer. Thus, in service-based businesses the customer performs a double role as consumer and co-creator (Rosada, 1990; Vargo; Lusch 2004). Thus, SBBM requires a reconfiguration of the whole process, incorporating the new role of the customer as co-creator of value as well as the new assignment of tasks performed by the provider.

In SBBM at least parts of the operational responsibility are transferred to the provider (Auramo, 2004), for example only parts as a result of operating a machine are sold to the customer, not anymore the machine. This issue is addressed in the next assumption:

Enhanced Responsibility: In SBBM there is a shift of risk implied as the ownership of the product is not fully transferred to the customer anymore: the responsibility of the performance, thus the risk of not meeting the promised level is transferred from the customer to the provider. Oliva and Kallenberg (2003) name for example the operating risk which is handed over when the provider takes over the production and is paid by the parts produced (Oliva; Kallenberg, 2003). Other studies term this as

“spread” of risks between customers and provider (Lay et al., 2009). In business models where availability levels are sold to the customer, the provider takes over business process formerly executed by the customer and by that absorbs also part of the production risk. In result-oriented SBBM where the result as the outcome of operating the product is sold, resembling an outsourcing of productive functions, providers take over the responsibility for the complete production process. Selling not anymore the product but the use leads to a restructuring of risks, responsibilities and costs traditionally tied to ownership (Baines et al, 2007). The sale of use, delivered throughout the service process including physical artefacts (Sampson; Froehle, 2006) requires an increased customer orientation particularly as the provider bears part or full operational responsibility for the corporately achieved outcome (Auramo 2004).

The aspect of the importance of a corporately achieved outcome leads over to the following assumption:

Customer Specificity: SBBM target to solve a unique customer need (Davies, 2004). Hence, the development of the offer has to go on jointly with customer and provider (Sawhney et al., 2004). Tuli et al. (2007) links the solution effectiveness to the quality of the definition of customer requirements, the quality of the way product and services are customized and integrated and lastly to the quality of deployment in matching customer needs (Tuli et al., 2007). Therefore, value in SBBM is context specific and cannot be defined generally (Fischer et al, 2008).

Next, in order to gain theoretical insights on possible sources of value-added through SBBM, from the existing multitude of theoretical perspectives dealing with business management particular approaches that seem to be applicable to the above presented characteristics are outlined.

3.2. Theories applicable on SBBM

Theories are an indispensable part of scientific work; they are at the same time foundation and result of revolutionary ideas. An underlying body of theoretical arguments is seen as means to differentiate between fads and fundamental developments (Picot, n.d.). Theoretical knowledge provides the description of traceable and sound interrelationships between targeted factors; they provide starting point and clue to deduce guidance for concrete problems (Picot et al., 2008). Applying these functions of theories to the issue of SBBM involves two tasks: First, theoretical perspectives matching the identified characteristics need to be identified in order to perform in a second step a theoretically-guided analysis of the sources of value-added in SBBM.

Although a consistent theory explaining impacts on SBBM respectively product-service bundles is lacking, initial work in this field to build upon exists. Insights from new institutional economics initially brought up by Toffel (2008), Hockerts (2008) and also Hypko et al. (2010) are taken as starting point and extended by a review of the resource-based-view of the firm induced by Burr (2002). By linking theory to the phenomenon of product-services bundles, the referred approaches used different criteria to derive value-added created in SBBM. Toffel structured its thoughts along transaction-cost-theory (Richter; Furubotn 2005), whereas Hockerts for example in his work organized its argumentation along the five types of property-rights provided by institutional theory. The article by Hypko et al. (2010) analyses the benefits and risk of per-

formance-based contracting as a special type of SBBM under an agency theory perspective.

In the following the applicability of the selected theoretical perspectives is shortly described, referring to the mentioned new transaction characteristics of SBBM.

Enhanced Responsibility/Customer Specificity: New institutional economics, represented by transaction-cost-theory, property-rights-theory and principal-agent-theory, underpins amongst others behavioural concepts of bounded rationality and information asymmetry. As a part or the full operational responsibility is shifted from the customer to the provider also the demand of information on both sides as well as the incentives to bring this information in are affected. In product-oriented business transactions mostly the provider holds a higher technical expertise of the good especially this comes true for complex capital goods in the engineering sector. Due to that information asymmetry customers might fear opportunistic behaviour of the provider by exaggerating the reliability of the product or the intentional usage of minor quality parts. As in SBBM the revenue of the provider is tied to the performance of its good, this information asymmetry loses relevance (Toffel, 2008). In addition the provider gets incentives to increase the availability and efficiency of its product. SBBM comprise a customer-specific value proposition and value is created within the customer specific value chain. Hence, both parts make a specific investment in the relationship within SBBM. The provider designs customized products and often in doing is so lowering the potential of a re-sale. Whereas the customer company not only gives the provider insights into its value chain processes, additionally it “outsources” the availability of internal production functions. In doing so, the customer hands over the control of internal processes at least partially to an external party and makes itself “vulnerable”. Thus, on the one side as a result both actors are more locked-in in the relationship. Due to their specific investments there exists a higher potential of an opportunistic behaviour by one of the actors. On the other side the higher level of customer specificity mostly comes along with an intensified customer-provider relationship that can evolve into a co-operation characterized by mutual trust and respect. Of course SBBM cannot be advocated as perfect solution, hazards, of course, due to information asymmetries now possibly arise on the provider side.

Enhanced Responsibility/Co-creation: Moreover the stock and coordination of internal resources, such as knowledge, skills and expertise by the provider determines the delivered service quality. In SBBM the functionality of the product builds the core of the transaction and not anymore the sale of the product. Therefore the competences and capabilities of the provider to deliver the proposed level of functionality over a fixed period after the product is produced influence the potential value-added that can be achieved. Hereby not only competences of organizational arrangements and technical expertise are of importance, due to the needed interaction with the customer – the co-creation of value – communication skills and the ability to solve customer specific problems is of outmost importance. Therefore, the resourced-based view of the firm and its enhancements, especially the relational view (Dyer; Singh, 1998) highlighting the importance of type relation kept between the actors, might contribute to explain why efficiency gains can be achieved through service-oriented business concepts (Burr, 2002).

Co-creation/Customer Specificity: Additionally the service process, as incremental part of these offers, demands professional expertise, economic rationality and communication skills of the service worker as the value is not anymore created in ab-

sence of the customer but co-created with the customer. Thus, the theoretical approaches developed under a production dominated paradigm will be enriched by findings of a deeper analysis on the actual debate on service characteristics and services science.

Changes in Environmental Conditions: Customers of the manufacturing industry demand not only a product but a comprehensive solution to a customer specific problem (Oliva; Kallenberg, 2003). Trigger for this development is to reduce the level of complexity within the company and be more flexible to respond to the changing markets. Due to the technological advance products directly or indirectly linked to the use of latest technologies enlarge the scope of application or allow for a more efficient use. But mostly this is means also that the complexity of operating the machinery increases, that makes it difficult for the customer to actually use the full potential of the product (Lay, 2003). Thus, offers where only the use or the result is sold solve this problem for the customer. They imply a shift of duties from customers to providers who are due to their higher technical knowledge of the specific product they have designed in a better position to exploit the potential in terms of efficiency. Other trends beyond transactional characteristics are the increasing demand of customers for tailored solutions (Auramo; Ala-Risku, 2005) and awareness of sustainability issues in society (Rothenberg, 2008). This external factors can as well be linked to a theoretically analysis under a resourced-based perspective discerning between internal and external rent-generating inputs (Conner, 1991).

In contrary to the above outlined theoretical arguments also aspects from behavioural economics need to be integrated. The rationale behind this is that in some situations where despite a theoretical derived value-added exists individuals refuse to absorb this value. And of course in a reverse logic sometimes people act intentionally in their disfavour. For example being the owner of a physical artefact already contains a specific symbolic meaning for people, which might influence their perceived value of advanced service offers. This paradox in rationale behaviour should be analysed by the insights of behavioural economics. Therefore, insights of behavioural economics should be taken into account to respect at an early stage real world conditions.

3.3. Developing Hypotheses

After outlining differences in the mode of transaction in SBBM and identifying theoretical arguments responding to these differences, hypotheses on value-adding potential of SBBM can be formulated. Due to space limitations one hypothesis for each dimension is presented in more detail. First the theoretical backbone is presented resulting in the formulation of the hypotheses, secondly preliminary results of the interviews from experts of the machine tools building industry, of pressurized air sector and experts in manufacturing in general will be laid out. To capture in this stage of analyses the origin of value-added the following economic formula, is applied:

Value added: Output x price – costs (labour costs + capital costs)

This simple equation resembles the notion that value is created through benefits and sacrifices (Lapierre, 2000). Value-added in SBBM can be achieved through maximizing the output and/or price and/or minimizing the related costs.

From a resource-based perspective SBBM pave the way for the improvement of productivity for the customer and provider company. As through SBBM not anymore the

product is sold but specific functionalities are transferred to the customer, both actors can focus their attention on their core competences. The concentration on these special competences can result into the elaboration and/or strengthening of a sustainable competitive edge for both actors, resulting in higher and robust earnings. Thus, value-added would be generated through maximizing the output of the customer and provider company.

From a customer perspective the concentration on the core competences of the individual company implies that all activities not directly relevant to keep the competitive advantage can be subject of outsourcing to the provider. The bounded resources can now be employed for the elaboration of valuable, rare, in-imitable and non-substitutable resources. Additionally the customer benefits as the provider brings in its special capabilities in optimizing the functionality of the product for a fixed period after the point of sale. This can result also in an increase of output due to the specialized knowledge brought into the production process by the provider and also a reduction of costs through an improvement in efficiency of the production process.

From a manufacturers perspective, SBBM enlarge the own set of competences and capabilities. The product know-how of the provider gets enriched by competences related to the operational behaviour of the products. The achieved knowledge can be fed back into the design process and enlarges the existing knowledge base and promote the advancement of the product as well as the service portfolio. Related to costs, this can lead to an increase of output, as through the acquired knowledge, innovative product features matching customer needs in a better way than the competition can arise. Thus the following hypothesis is derived:

H1: SBBM enhance the value creation at customer as well as provider, as both can concentrate on their core competences.

Five types of property rights can be defined: the right and obligation to maintainand operate a product, the right and obligation to dispose of a product, the right to exclude others and the right to use a product (Furubotn; Pejovich, 1972). From the perspective of the property-rights-theory the grouping of all property rights and implicitly also duties leads to an incentive for the provider to extend the life time of the product.

In the traditional product-oriented business model the provider benefits through the sale of the product and through delivering after-sales services like maintenance, repair or selling spare parts. Delivering now the functionality of the product, every additional breakdown of the product or replaced spare part create additional costs and may also affect the contractual fixed performance or quality level. Thus, through a change in the property rights structure SBBM sets incentives for the provider to use parts and components with a high quality and in correspondence long life span to minimize costs. Has every repair or every order of spare parts in the traditional model mostly been paid by the customer, through the decoupling of property and value creation within SBBM, the provider now bears the costs. Especially as spare parts and repair often allow the provider to realize higher margin, however, through the new mode of transaction, these costs have to be charged internally and are then in a more strict way subject to critical revision. For the provider monetary benefits can be seen in optimizing the cost structure for e.g. spare parts which were previously not in the centre of attention. Another benefit for the provider can be seen in a higher outcome, resulting from a positive image, as customers do not have to fear hidden costs anymore.

For the customer the menace of opportunistic behaviour of the provider by the intentional use of inferior parts is diminished. As the customer is not focused anymore to decide upon the sale price of the product, the provider is able to build in high quality materials, without lowering its chances against low-cost competitors. If the extension of the products life time also implies that less new products have to be fabricated, then also the consumption of natural resources will be reduced. Resulting monetary benefits are realized through a reduction of costs, e.g. spare parts or reduced cost for downtime of the product or a reduction of scrap. These considerations lead to the following hypothesis:

H 2: SBBM create incentives for the provider to extend the life time of its products and diminishes the consumption of natural resources.

The definition of service characteristics is controversially discussed in scientific literature (Sampson; Froehle, 2006). One of the prominent attributes of the ones discussed in literature is the integration of the customer in the service process (Rosada 1990). Through the necessity of the interaction of the customer in the service delivery process the requirements for the employees in the service unit change. The willingness and the extent of interaction of the customer is a highly relevant factor influencing the quality of the performed service. Employees in the service business, thus, have to re-act on the varying contributions of the customer and also re-act upon characteristics of different customer employees and dependent to situation find the right way of communication and motivation to nudge the customer into a co-operation. In addition service employees should be able and motivated to anticipate unsaid customer needs. For the customer for example lower personnel costs incur as flexibility is now demanded from the provider.

Value-added for the provider can be created through a higher output as high quality service positively influences customer image and strengthens customer retention. But at the same providers must try not to equally higher the labour cost due to overtime, nightshifts or illness because of excessive demand of the job.

Based on these considerations the following hypothesis is derived:

H 3: SBBM require a higher flexibility of the service employees in the manufacturing sector.

3.4. Explorative Refinement of Hypotheses

3.4.1. Interviews

On the basis of the identified hypotheses an interview guideline was elaborated, where the hypotheses were split up into one to three questions to disperse a complex interrelation into linear traceable relationships in order to capture most of the experts' knowledge, experience and thoughts on SBBM (see Table 1). The experts were identified on the basis of the literature review persons from research, but also from industrial associations and companies.

Hypotheses	Related Questions
H1	What are the main objectives for providers of SBBM (producers, waste managers or third parties) to offer these services?
	Which motives of customers stand behind the decision to apply SBBM?
	How does the concentration to core competences of customer and provider influence the design and offer of product-service bundles?
H2	Are products specially adapted for the services offered in SBBM?
	Do SBBM influence the product features, i.e. do any features become more important, so that the provider increases his effort? If so, which features?
H3	How do SBBM affect working conditions (quality, security, force) for provider and customer personnel? What are the reasons?
	In comparison to the traditional business model, are there any differences concerning the payment conditions for the operating personnel or the maintenance personnel?
	Compared to the traditional business model, do SBBM have any other social effects? Can you describe these effects?

Table 1: Hypotheses and corresponding questions

The expert interviews were conducted from April 2009 to November 2009 and took between one and two hours and were done either face-to-face or via telephone. In the interview always two interviewers participated with the following distribution of tasks: One leads the discussion and the other one takes written notes of the interview. Afterwards the protocols of the interviews were sent back to the interviewee for revision. After the interview, the interview reports were analyzed by three researchers independently to guarantee profound results. If there was a deflation concerning the interpretation of certain information this special issue was discussed again within the group of researchers. The interviews were evaluated by means of a content analysis. To answer traditional criteria of reliability of the results the analyses of the answers to each question was carried out by multiple researchers. Furthermore addressing newly established quality criteria of qualitative research, the procedural manner has been carefully documented and the evaluation of the hypotheses is embedded into a written argumentation. Contributing to the traditional criteria of validity the questions included in the guided interview are based on the hypotheses which as outlined before were derived from theory that draw on a combination of well established organizational and management theories (Mayring, 2003). The following analysis presents

results from the evaluation of the interview protocols of a sample of 10 experts from the manufacturing sector.[1]

3.4.2. Findings

Hypothesis 1: First, different motives for customer and provider of SBBM were reported. For the customer most prominent was the reduction of costs, an increase in flexibility and savings of resources. For the provider a gain in process know-how and first-mover advantages were mentioned. But also the re-active position of providers, as they were pushed into these new types of business models from their customers was outlined by the group of experts. The concentration on core competences as enabler for the creation of value-added evoked contradictory opinions. Statements of the experts expressed that the concentration on core competences plays no role under real world conditions whereas also experts confirmed that the lack of know-how in non core-processes is the prerequisite why customers outsource parts of their business processes.

Incorporating the insights of the expert interviews hypotheses one should be adjusted as follows:

> *H1: SBBM enhance the value creation at customer as well as provider, as both can concentrate on their core competences.*
>
> *H1 a: SBBM create value for providers as they lead to product and/or service and/or process innovation.*
>
> *H1 b: SBBM create value for customers as they lower operating costs.*

Hypothesis 2: The answers for this hypothesis diverge between the experts. The majority of the interviews affirmed that SBBM lead to an adaptation of product characteristic resulting, amongst others, in an extension of the life time of a product and the usage of high quality materials. The given answers approved the adaptation of the product in SBBM but not necessarily with the result of a life time extension of the product. These findings recommend a refinement of hypothesis 2 as follows:

H 2: SBBM create incentives for the provider to extend the life time of its products and diminishes the consumption of natural resources.

H2a: SBBM create incentives for the provider to perform an adaptation of product characteristics.

H2b: SBBM create incentives for the provider to extend the life time of components and parts.

[1] The expert interviews are part of the project “Hywert – New hybrid value added concepts as opportunities for sustainable development” funded by the German Federal Ministry of Education and Research within its program “Innovationspolitische Handlungsfelder für die Nachhaltige Entwicklung” (Innovation policy actions for sustainable development).

Hypothesis 3: Again the answers of the experts provide contradictory statements. On the one side a change in the required flexibility of the working force in the service units was neglected by some of the participating interviewees. On the other side, some experts affirmed that in SBBM the flexibility demanded from the employees is higher. Specified issues during the interviews were for example, the demanded quick response to customer problems, the addressing of specific customer needs and the broaden range of possible solutions including the optimization of the physical artifact and/or the service process. As voiced by the experts the ability to address customer needs and to respond to them by either adapting the product or the service characteristic or both, hypothesis 3 could be refined by building three sub-hypothesis:

H 3: SBBM require a higher flexibility of the service employees in the manufacturing sector.

H3a: SBBM require the application of innovative organization concepts at the provider.

H3b: SBBM require a higher need of training for provider employees.

H3c: SBBM require a higher internal cooperation between employees of the service, manufacturing and R&D personnel.

H3d: SBBM do not lead to a higher rate of absenteeism due to illness in service units.

Although none of the presented three hypotheses was refused unanimously the need for refinement of the derived hypotheses became clear. The insights gained through the expert interview also highlighted the heterogeneity in the manufacturing industry resulting in diverging priorities of the individual aspects of SBBM.

4. Next Steps

Key contribution of this paper is a theoretical framework resulting in a set of hypotheses on how SBBM can lead to an improvement of economic, ecological and also social value. Additionally, the followed conceptual approach of explaining the interrelation of service orientation and value creation in manufacturing industries contributes to clarify the nature of value in all three dimensions. Based on the literature research hypotheses have been identified covering the impacts of SBBM in manufacturing industries on creating value for both customer and provider. The expert interviews have been conducted to evaluate to which content the theoretical assumptions apply under real world conditions.

Next step in this research approach is to test quantitatively the refined hypotheses. A future research target would be to analyse what kind of interrelation between the individual dimensions of value exist. Empirical studies on analyzing the link between economic performance and environmental measures come to contradictory results. Whereas several studies come to the conclusion that no correlation between profitability and environmental performance of a company exist (Rockness; Schlachter; Rockness, 1986) others approved a correlation. For example Pullman et al. (2009) have proved that there is a positive impact of ecological activities of a company, including company internal measures as well as in cooperation with partner, and their

ecological and economic performance. Another advantage of getting active in the field of economical efficiency within a company is the positive impact on the quality (Kleindorfer et al., 2005). Hereunder is the reduction of waste, economic efficient application of resources and the transparence and control over internal processes (Corbett; Klassen, 2006). Furthermore studies of Rothenberg (2007) highlight the correlation between reduced material use and reduced costs equally helping the customer to reach its goal through SBBM. Russo and Fouts (1997) in addition review in their work the interdependency of economic, ecological and social activities.

The results of these studies indicate that interrelations between the three dimensions of value creation exist. Therefore, future the aim of this research is to elaborate a structural equation model based on the identified and validated hypotheses to reveal the interrelation of value creation of service-based business models.

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