Early Stage Assessment of Service-based Business Concepts

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Abstract

In literature the positive economic effects for suppliers and customers of Industrial Product-Service Systems (IPS^2) have often been described. However, provider companies often struggle when it comes to realize win-win potentials. Therefore, an early stage assessment is needed to allow companies to forecast benefits, risks, costs and profits of the new business model in early stages of IPS^2 planning.

It will be shown how business plans can be used to describe and assess the process, requirements and pitfalls in creating added value via IPS^2. The results of two case studies of machine tool manufacturers turning into solution providers are reported.

Keywords

Service-based business concepts, Business planning, Case studies

1 INTRODUCTION

Developing innovative products proved to be a risky business: the overall success rates are low [1] and it appears to require 3,000 ideas to develop and introduce one substantially new offer into markets [2].

Research analyzing 'how to increase success rates in innovation' has highlighted the importance of the 'front-end' stages of innovation processes [3, 4]. The greatest opportunities for improving the overall innovation process seem to lie in the very early phases of new product development [5]. At this early stage, the effort to optimize is low and effects on the whole innovation process are high [6, 7].

Successfully developing innovative products emphasizes during the front-end phase both the market and technical assessments before the projects move into the development phase [8]. Further, successful business emphasizes the voice of the customer and the strong market orientation, especially in the early stages. A crucial task in front-end innovation processes is to reduce uncertainties [9]. Recent studies [10, 11] clearly indicate that successful innovators are distinct from less successful ones by their enlarged and more systematic front-end activities.

Developing new business concepts comprising a new value proposition, a new revenue model and a new value chain architecture [12] seems to be a much more radical innovation compared to the development of 'merely' innovative products. Hence innovation processes targeted towards business concept innovation should highlight the front-end phase even more due to the increased capacities involved in such processes.

Against this background, the following paper proposes a concept for organizing front-end activities in business concept developing, including the business model approach. It is organized into the following sections: after introducing 'business planning' as a means for early stage assessment (section 2), a specific business planning model for service-based business concepts is described (section 3). In section 4, two case studies will clarify how to utilize this specific concept in industry. Section 5 summarizes the results and explains the need for further research.

2 BUSINESS PLANNING AS A MEANS FOR EARLY STAGE ASSESSMENT

Business planning is a means to systematically assess the potential of success for new businesses. Mostly business planning is seen as an activity strictly reserved for start-up firms. However, a business plan is an equally important instrument also for entrepreneurial analysis of new ventures.

The influence of business planning on venture success is discussed in a contradictory manner in the literature, as studies provide empirical data advocating the positive and also neutral affects on an organization's performance exist. Researchers promoting the positive influence of writing a business plan argue that planning activities lead to a more efficient use of resources [13] and reduce the likelihood of termination [14]. Other researchers raise doubts about the value of business planning, arguing that the time invested in planning would be invested more productively in the acquisition of resources and emphasize that planning could lead to organizational inertia [15]. Actually, both schools are right. Formal planning, mainly in the entrepreneurial context where a business infrastructure already exists, might reduce firms' ability to adapt to changes in their environment as multiple organizational hierarchies are involved in the decision process which significantly expands the time and money invested [16]. Additionally, formal planning activities can give a deceitful feeling of control, suppressing the openness needed for problem solutions [17] and often channels activities along well-worn tracks. Inherent in any planning action is the risk of applying a meaningless ritual uncoupled from its objective [18].

But also the planning school advocacies have strong arguments. Planning structures your mental model and forces you to bring it to paper and make it understandable for others, mostly to financial investors, who have a very critical eye. Formal planning also improves the decision-making process by providing structures, revealing information gaps and examining subjective assumptions [19]. In addition, planning activities help to identify goals and set up specific milestones for achieving them. Especially when people have to solve problems where uncertainty is high and they cannot rely on experience or

habit in this field to begin with, a structured planning process can be invaluable.

In the context of establishing new ventures or a new business area, planning gives an orientation for the timing of resource flows, of the supply and demand of resources needed [20] and allows bottlenecks in the value chain to be spotted [21]. Formal planning forces people to transform concrete ideas into an action plan and thus to draw a line between intended result and activities needing to be done. All the listed advantages contribute in terms of resources e.g. financial and timely resources, to minimize misdirected effort [22].

With respect to the argumentation from both sides, business planning is seen here according to [23] as highly beneficial for future success, provided that the involved actors see it as an adaptive approach, not limiting their point of view to the established plan. Instead they must be open to changes in requirements in a dynamic environment and in real market needs. The process-related character of business planning cannot be over estimated.

A business plan is the written output of the prior business planning activities. Though different styles of business plans exist, in the prominent literature the needed input data is widely agreed upon/consensual [24]:

- Executive summary
- Product or service description
- Market analysis
- Marketing and sales strategy
- Business model and organization
- Team
- Opportunities and risks
- Financial planning and
- Milestone schedule

Elaborating a business plan can take between three months and one year, depending on how much time is invested daily and by how many persons. Facing the fact that a brilliant business concept in mind does not imply that it works in idea has to be made in order to minimize invested time and costs which might be without success. Before setting up a detailed business plan, a general plan on a higher aggregated level should be established. Here the idea should be transformed into a basic business model. In the business model the value proposition of the good or service for the customer should be explained, a rough plan of the architecture needed to produce and deliver the good or service should be set up. Then also part of the business model is to define the revenue model. All three components need to fit together to resemble a consistent business strategy. After the business model is drawn up, a thorough market analysis has to be performed next. Personal estimations on the customer potential strengthened by enthusiasm for the own idea are illusory. Therefore an assessment of the Porter's Five Market Forces [25] will provide an answer if any more effort in planning the new venture is approved at all.

Business planning is a worthwhile instrument for both start-up firms and already existing ones that aim to start a new business field. Within the first step of formally structuring a general business plan the potential of business models can be assessed at an early stage. In doing so, a proper estimate of the probability of future success or failure of the business model is possible, with a minimum expenditure of time and resources. As mentioned before, planning is a process and therefore should be open to adjustments at all times. Even if a concrete business concept is not appropriate to actual market demand, the business model can be adapted to suit incorporating all the gathered information as it is still at an early stage.

3 BUSINESS PLANNING FOR SERVICE-BASED BUSINESS CONCEPTS

Setting up a general business plan helps manufacturing companies to objectively forecast risks and opportunities as well as the expected added value before putting any service-based business unit in place.

'The business model approach suggests a more fluid gestalt, one that is more than the sum of its parts by having mutually reinforcing virtuous circles between its elements but is simultaneously robust, self-regulation and self-adjusting.' [26]

Offering industrial service-based business models taps different aspects in turns of external market demand e.g. different customer needs and requirements. Also from an internal perspective, delivering solutions challenges the organizational structure [27] in different ways compared to the traditional product-based business. Considering this, planning to enter the service business by just expanding the already existing industrial service activities might be a false perception of the requirements in this kind of business. But as business planning is a process where constant learning and adaptations are explicitly wanted, it is an idea to start from evaluating the market potential. In a first step of the general business plan a business model for the idea has to be set up.

3.1 The business model

A business model roughly describes the business activities of a company [28]. It can be seen as how a company has to be organized to satisfy certain customer needs [29]. Scientific literature provides no clear definition of a business model. Though various definitions exist, they claim similar domains as mandatory parts of a business model. However differences can be seen in the aggregation level of dimensions. This might come from the background of the corresponding authors and the differing focus of the manifold disciplines in management research. For a detailed list, see [28].

In this paper we follow the approach of [29] and [30], later comprised by [31]. According to them, a business model contains three dimensions:

- Value Proposition which defines the value generated for the customer and other actors involved in a business transaction. And we also consider it necessary to define the value added for the own company here. Not in detail, but a rough idea of what kind of value added, e.g. information, monetary revenue etc. should be stated here.

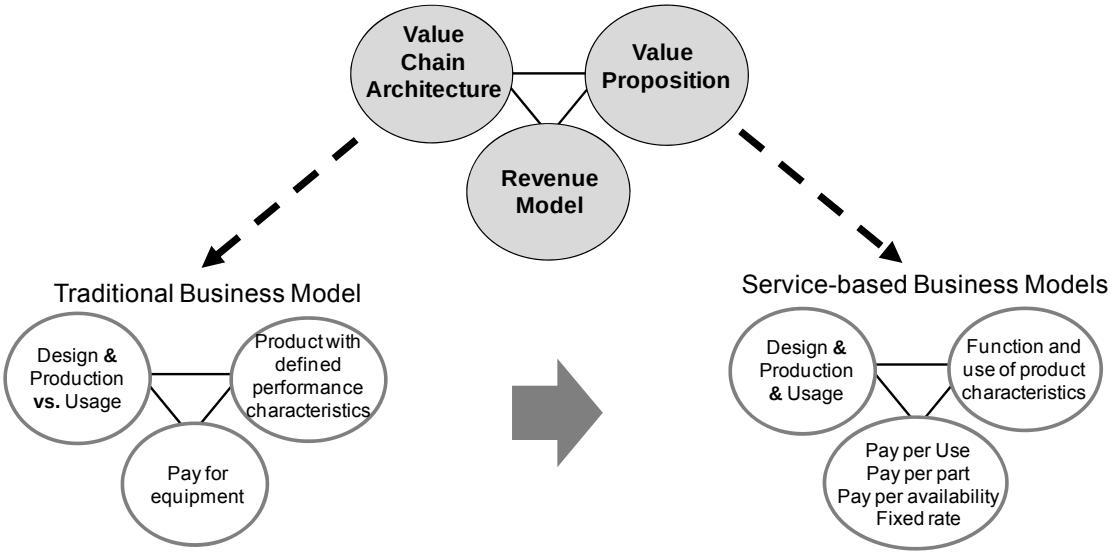

Figure 1: Business model innovation.

- Value Chain Configuration which defines the actors, their roles and their contribution involved in the value creation
- Revenue Model which defines the source and type of the payment.

3.2 The business model innovation

Offering industrial product-service systems in most cases requires a business model innovation because the way of doing business significantly differs from the traditional product-oriented model. Retaining the above presented approach according to [12], a business model innovation applies when at least two out of the three dimensions are modified. The need to establish a new business model for service-based offerings comes mainly from the strengthened importance of service for the value creation. In Figure 1, this shift from the traditional business model–designing and producing high quality products which are sold by the customer in a single business transaction–towards industrial product-service systems embedded in innovative business models is illustrated.

Especially business models selling the use or the result of capital goods (cp. Figure 2) entail a shift of risk from the customer to the provider. This innovative value proposition involves a rearrangement of the value chain architecture. Service characteristics, though their degree varies, like intangibility and the interaction with the customer in the value creation process, requires restructuring of former transaction oriented structures [32]. Furthermore, the renunciation of the product price is necessary as the revenue model requires reinvention of pricing mechanisms [33]. The complexity of establishing and coordinating these structures e.g. establishing new organizational principles and routines, often in addition to the traditional model, is a major management challenge. But it is the complexity that, handled successfully, builds the basis for a sustainable competitive advantage as it is difficult to imitate [34]. How to initiate a structured development of business models for industrial product-service systems already in an early stage in the three dimensions of the business model and key questions to be answered for each of them are outlined in more detail.

3.3 Value Proposition

In a first step, the value proposition of the new service-based business concept has to be described. It must answer the question what kind of customer need–already existing or unnoticed–is fulfilled [16]. The evaluation of the customer need has to be done from the customer's perspective. Splitting up the customer value according to the dimensions of time, quality and costs helps to systematically derive the key factors of value creation [11].

On the other hand, the added value for the own company has to be captured. The pursuit of generating value is inherent to every economic, but value does not automatically equal generating ample profits. Although high margins are often entrenched with being active in the industrial service market, also indirect monetary revenues can lead to a win-win situation for the manufacturer. Services presuppose a co-operation of customer and provider in the transaction process; this service intrinsic characteristic could be used to actively make use of the intensified customer provider relationship (for the sake of both parties). Gaining access to information about the

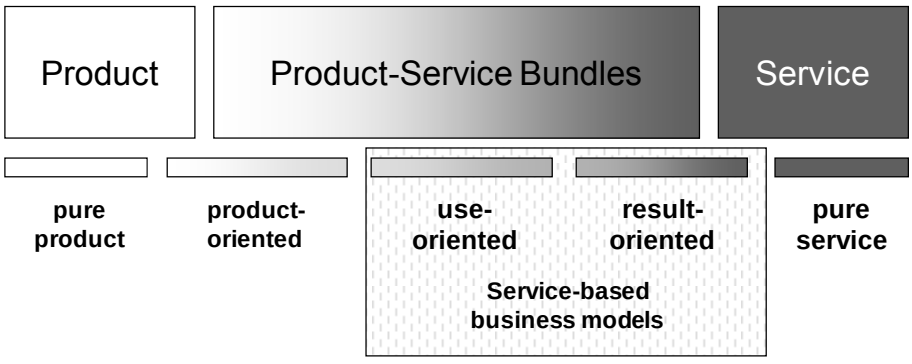

Figure 2: Service-based business models in a product-service continuum [adapted from 35].

customer production process and the usage of the product can be one source of value for the manufacturer. The formerly restricted information on customer behavior and actual problems is now open and a source of future product as well as future service innovation. Another purpose of offering service-based business models is to retain or expand the already existing customer basis. Especially when services in the manufacturing sector are offered as re-action to customer pressure, a clear and straightforward formulation of the value proposition supports further planning and analyzes the chances by accepting the deal which for example reveals synergies by clustering other customers through the market analysis. It helps also to weigh the risks and losses of accepting an offer prompted by customer pressure and also the risk of losing this customer before signing the contract.

So the next step for an early assessment would be to analyze the market and the target customers–also part of the detailed business plan. First the targeted market as a whole has to be described. Statistics that can easily be gathered for this purpose are the sales volume and growth margins of the total market–for service-based business concepts, for example, the existing customer basis could be targeted by offering availability guarantees. Hereby conflicts with the prevailing business model might arise. The offer of service-based business models might disrupt the traditional way of doing business in one sector. Therefore, this issue should be carefully dealt with and implications for the future strategy of the company have to be reflected.

Then the macro environment should be scanned, analyzing technological, legislative, economic, social and ecological influences. Especially ecological and legal regulations are gaining more importance in the manufacturing sector. The ability to anticipate future regulations concerning environmental policies might be a promoter of or barrier to the success of the business model. The advantage of already existing companies is that a systematic analysis of the business environment in an entrepreneurial context could be conducted with less effort than in start-ups. The needed knowledge is often already present in the firm through sectoral newsletters and the membership of sectoral associations. However, again it must be emphasized that although there is already expertise concerning the manufacturing sector in the company, formal planning methods benefit information gathering as they could be used as means to test the subjective assumptions by juxtaposing outside and also an objective perspective. Then the specific market or market niche has to be assessed. This question though of major importance is often carelessly dealt with. Therefore, characteristics of customer companies for which the new business model offers value added have to be identified, e.g. companies of a certain size, certain volume of demand, local restrictions. Results from that analysis should be discussed with employees from the design department, service department and marketing and sales [24]. Also customers with whom a relationship of mutual trust exists should be consulted if the value proposition really fits their needs. Take again the availability example: if you want to offer your customers a service to guarantee 95% availability, you need to assess what percentage they already realize. Furthermore, an internet search for competitive offers sheds light on the actual market demand. If no offer like this exists, it might be a disruptive business idea or it might be an idea that does not fit the market demand.

Although it is extremely difficult to precisely assess the customer potential at an early stage, the aim is here to get a feeling for the dimension, whether 5%, 20% or 50% of customers of the manufacturing sector are potential customers. The formulation of the value proposition also influences the design of the service and machine. The features of the product-service system have to be derived by the value proposition and have to be clearly documented [31]. In addition, the value for partners by participating in the business has to be clearly outlined.

If the assessment of the market conditions, the aspired market potential or the expected customer group and needed partners do not give sound proof of a future business opportunity, further efforts on realizing this value proposition should be terminated.

- Step one: Reveal win-win potential.

3.4 Value Chain Architecture

Changes in the value chain architecture of a product-oriented company are inevitable for delivering service-based business models. Despite the heated debate on the importance of organizational challenges in scientific literature, the changes to be carried out in the value chain are often neglected. [32]. [37] describe it as 'They sometimes underestimate the operations challenge that is required to transform a good to value package, and effectively manage the service component. Operations processes, resource characteristics and structure may have to be changed.'

Of course, at that early stage a detailed organizational planning can neither be done nor should be done. Here it helps to bear in mind the following effects of service-based business models to the organization. First of all, is the physical product applicable to service-based business concepts or are any adaptations necessary? Then, inherent to the sale of use or of the result in service-based business models is the shift of risk from the customer to the provider. Accordingly, the value chain has to be prepared to cope with that risk. For example, selling use in form of ensuring a certain kind of availability guarantee requires from the provider to be able to solve any malfunction within a limited time span, no matter at what time and in what geographical region. On a sub-level, this demands a high level of flexibility of internal processes and also of the employees. Subsequently, the need for any external cooperation has to be assessed. Another service characteristic playing a major role in these business models is the integration of the customer in the value creation process, so-called value co-creation [38]. In this it has to be taken into consideration which channels are available to a provider to control the action of the customer as this party as well influences the quality of the service. Implications of the required higher level of customer interactions and interfaces need to be anticipated. It has to be kept in mind that being a service provider disrupts the self-image of a manufacturing company and also of its employees. It must be conceived as a hurdle otherwise it cannot be surmounted. Re-establishing the value chain architecture for delivering service-based business models requires the aspects in which the service-based model diverges most from traditional manufacturing to be identified.

- Step two: Mind-Set.

3.5 Revenue Model

Both sources and purpose of the gained return are defined within the revenue model [30]. Manufacturing companies often have a long tradition in delivering industrial services, e.g. spare parts, customer training. But few of them have priced their customers for that. Services

have been given away as promotion to sell the product. Now as the firm is turning into a solution provider by bundling products and services, the contribution of the service activity to cover the costs has to be re-assessed.

At this stage of business model planning it needs to be defined on what basics the customer should be priced, is it the availability level that is kept, is it the time span of service delivery, is it the flexibility of outsourcing peak production capacities or is it the cost reduction that could be achieved through the know-how of the provider?

There is no clear scheme serving as an orientation for providers as service-based business contracts are often marked by a high level of individuality. It has to be reasonably assessed where the win potential for the customer comes from (see Value Proposition) and what costs have to be covered for the provider.

- Stage three: Assure Financial Benefits.

In Figure 3, the three-step-approach outlined above is summarized.

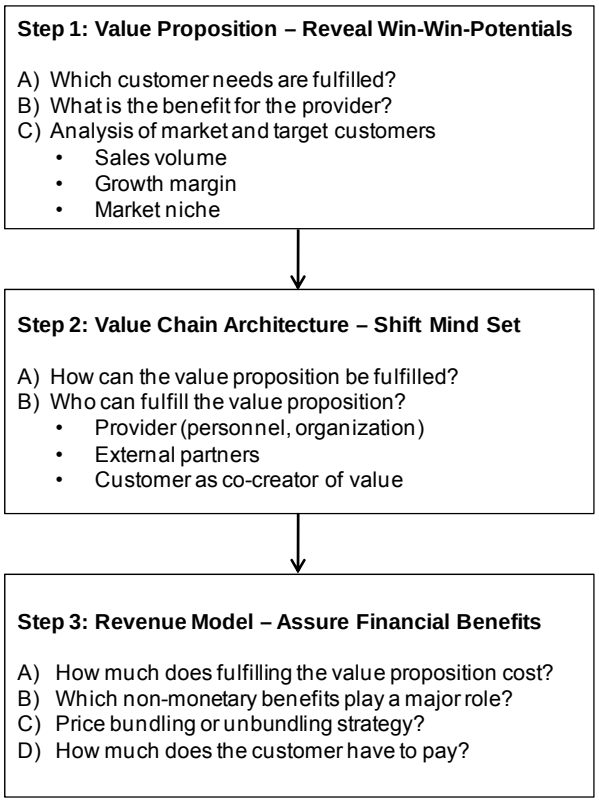

Figure 3: Three steps to business planning.

4 CASE STUDIES

The business planning approach aiming to support servitization decisions and implementation in the early stages, which was described above, was tested with two machine tool manufacturing companies. In doing so, the three step analysis depicted in Figure 3 was conducted and first a basic value proposition was identified and described on the basis of their customers' requirements. Subsequently, analyses of both customer and competitor market were conducted. In several customer case studies, i.e. interviews with actual and potential customers and complementary document analyses, the customers' attitude towards the new offering should be understood. The aim of the competitor analyses was to identify potential market competition. Afterwards, the impact of offering product-service systems to customers in the organization of the machine tool manufacturers was forecast on hierarchical and process level. The calculation of the revenue model was done by using a life-cycle software taking into consideration a variety of scenarios that could emerge and the risks associated with the implementation of the industrial product-service system.

4.1 Case study 1: Machine tool manufacturer providing an availability guarantee

The case study company is a large enterprise operating worldwide as one of the international market leaders in designing, producing, maintaining and supplying equipment and components for the railway and aerospace industry. They currently offer value-adding solutions in niche markets, i.e. customized equipment and basic services. The main revenue in this business model comes from payment for the manufactured machines and from corrective maintenance performed during the machine's life cycle.
On that basis, the case study company considers promoting and fostering additional services and service-based business concepts. In particular, the case study company takes into account offering an availability guarantee to a subset of customers.

Step 1: Value Proposition

When analyzing the company's customer sectors, the aeronautic sector turned out to be the most promising sector in which the business model could be implemented.

Results of a market analysis, i.e. four interviews with representatives of potential customers from the aeronautic sector, revealed that these are currently not familiar with service-based business concepts, but perceive the potential of their implementation. Furthermore, two of the four interviewed companies had already had good experiences with availability guarantees and were inclined and open for this offer. The main goals of the customer companies were found to be improving the financial performance as well as process quality and gains in productivity and availability.

The study of potential competitors was done on a trans-sector level as the examined companies were not only targeting the aeronautic sector. It revealed that large supplier companies had already started to introduce a more or less comprehensive range of additional service offerings into their portfolio. Maintenance, engineering and consulting as well as supplying spare parts turned out to be services commonly offered by machine builders in all sectors. Yet, availability guarantee contracts, defining a guaranteed level of functioning time without failures for equipment, supported by a pre-defined benefits and penalties system were not found.

Hence, the case study company identified an unfilled need in one of its customer sectors which was not served by its competitors.

Step 2: Value Chain Architecture

From an organizational point of view, the provision of an availability guarantee to the customers from the aeronautic sector requires several changes in the current organizational processes and structure of the case study company.

Especially planning of the preventive maintenance activities, like working out checklists and setting up databases etc., will require a temporary team of specialists from service, design, production and research and development. This team will be responsible for setting up draft service contracts and also elaborating time and task lists for the newly arising work packages.

Furthermore, the general structure of the service team was also revisited. Up to now, it is split into three main business units and hence maintains three service units, one for each business division. An analysis of the requirements that an availability guarantee implies resulted in the recommendation to merge the three service units into one service team, consequently realizing synergies in warehouse management, capacity utilization and spare part procurement.

Step 3: Revenue model

From the economic point of view, based to the hypothesized costs and profitability of the case study company a life cycle software tool was used to comparatively calculate the life cycle costs of the traditional business model–selling the machine and providing basic maintenance–to the provision of an availability guarantee. The calculations revealed that providing and using an availability guarantee respectively would result in a moderate increase in life cycle costs for both provider and customer but that the net present value for the case study company would almost triple while the net present value of the business model for the customer would remain as is. However, for the customer, also non-monetary benefits need to be taken into consideration, i.e. guarantee equipment availability which allows to better plan production and consequently consumption of resources. A risk analysis was carried out to provide a solid base for the final decision in favor or against an availability guarantee offer. A best and worst case scenario were assessed by changing the standard conditions. The net present value was forecast to be positive in both situations, with a 20.5% increase in the best case and a 38.5% decrease in the worst case compared to the standard scenario.

The case study company is going take these figures into account before making its decision on the new business concept in addition to the non-monetary benefits arising from this product-service system: the increase of the overall company competitiveness and performance and the chance of acquiring new customers and entering new markets.

4.2 Case study 2: Machine tool manufacturer providing a renting service

The case study company is a small enterprise specialized in electrical discharge machines, like sinking machines, wire electrical discharge machines and filtration units. Currently, the case study company provides its customers not only with equipment, but also with consumables and services like preventive maintenance, customer trainings, technical assistance and constant back-ups. Traditionally, the machines are either sold directly to the customers, i.e. the end users, or to distributors who later resells the machines to the end customers.

The main reason why the case study company considers going into a new service-based business model can be seen in the global economic crisis which leads to a worldwide economic slump. In this tough environment, the traditional value proposition–high quality equipment–is not sufficient any longer to keep sales growing and hence new services can be one way of making business with potential customers. Many EDM users are afraid of purchasing new equipment as they in the current situation do not have enough orders to justify this decision. Furthermore, customers who however are willing to buy new machinery might not be able to pay for it due to lacking funds or refused requests for bank loans. In addition, some of the main competitors of the case study company have already started to offer alternative types of financial services to their customers. Hence, it is vital for the case study company to take a new business model into consideration to improve its condition as some of its customers have already demanded financial services from them.

A renting service is a business agreement in which a payment is made for the temporary use of a good owned by someone else. The renter of the equipment is not interested in the ownership of the good but in its functionality. Though renting does not necessarily involve a financial institution, due to reasons of risk management, the case study company is interested in having a financial partner to avoid the risk of not getting paid by the renting company. So, the business transaction of the renting concept will be the following. If a customer is interested in renting a machine, a financial institution buys the equipment and rents it to the customer company. During the contract period, the case study company maintains the machine along with any other service agreed upon in a contract and the renter pays the case study company for the services and the renting feeds to the financial institution. If at the point of contract expiration the contract is not renewed, the financial entity re-sells the equipment to the case study company which will try to find a new renter for the machinery. In case the contract is renewed, the financing institution remains the owner of the equipment.

Step 1: Value Proposition

To understand the full potential for the proposed renting service and to identify the appropriate advertising strategy, five potential customers were interviewed. The interviews revealed that in 80% of the business transactions, the equipment was obtained with leasing contracts with banks while the remaining 20% of business transactions were done via direct payment using cash. None of the interviewed companies had received a proposal of direct financing or renting by their machine suppliers, hence they appeared to be interested in the renting concept. One of the main barriers identified during the interviews was the fact that the ownership of the equipment would not be transferred to the customer unless the supplier after contract expiration agreed to sell it.

From the competitor side, the interviews revealed that no other company in the EDM market offered renting services to their customers.

The case study company preliminarily forecast that 15% of their customers were going to use the renting concept and that the share of companies taking advantage of this service was going to increase gradually by 10% per year once the service would have become better known in the market.

Step 2: Value Chain Architecture

From an organizational point of view, the introduction of the renting service implies new tasks for marketing, sales and maintenance department of the case study company. Tasks like rating the customer's creditworthiness, setting up the contracts and dealing with missing payments were outsourced to the financial entity. The case study company provides its expertise in producing EDM machines and in maintaining the equipment during the renting period to keep up the functionality.

The existing hierarchical structure of the case study company is not going to be affected by the offer of a renting service and the preliminarily estimated number of customers will not demand for an increase in staff.

Step 3: Revenue Model

From the economic point of view, based to the hypothesized costs and profitability of the case study company a life cycle software tool was used to comparatively calculate the life cycle costs and net present value for both, customer and case study

company, in the traditional and the new business model. Thereby, three different scenarios after contract expiration need to be taken into consideration. The customer can decide to rent the machine for another five years. Supposedly, 50% of the customer will go for this option. The customer decides to no longer rent the equipment and the case study company takes it back and re-rents it to another customer after refurbishment. Probably, in 25% of the business transaction this will be the case. In the remaining 25% of business transactions, the customer decides to no longer rent the equipment but the case study company fails in finding a new renter for the machinery after taking it back.

Calculating these scenarios resulted in a positive net present value for the case study company. Yet, not surprisingly, it was shown that renewing the contract with the same customer resulted in the highest net present value and this consequently would be the best option for the case study company, mainly because costs like transportation and installation do only occur once. On the other side, the worst case would be that the case study company will not find a new renter after taking back the equipment which results in a net present value of -58% compared to the best case.

This calculation allows the case study company to understand and asses the impact of offering this renting service to the customer and to realize how the business transaction conditions change when compared to their traditional business model.

5 CONCLUSIONS AND NEED FOR FURTHER RESEARCH

In this paper, an approach was presented to assess the risks and benefits of service-based business concepts in early stages of their development. The tools and instruments used in business planning for start-up companies but also for intrapreneurial activities were connected to the three dimensions of new business concepts–value proposition, value chain architecture and revenue model. In a first stage of assessment, it is important for servitizing manufacturers to define value proposition, value chain architecture and also revenue model.

When doing the same considerations like entrepreneurs and intrapreneurs, it should become clear to a servitizing manufacturer what the win-win potential of the service-based business concept is going to be, how the mind-set in the providing but also in the customer company and in third parties needs to change and how financial benefits of a product-service system can be assured.

In two case studies it could be shown how the three steps interact and how win-win potentials can be revealed. Interviewing actual and potential customers and studying the offers of potential competitors, defining competences and tasks and the use of a life cycle costing software proved to be of great use for the two case study companies to establish a basis for a decision in favor or against offering a service-based business concept.

As discussed in section 2 of this paper, companies compiling business plans benefit from these, but also need to invest time and human resources in them. A business plan for a business model centering an industrial product-service system resembles a feasibility study for this offer and gives hints on potentials and pitfalls in early stages of business model implementation. Especially in service-based business models with a high level of customer integration and hence result variation and unpredictability, proper projecting of value, value delivery and value capture is needed. Resources that need to be invested in the compilation of a business plan are the other side of the coin.

Consequently, in future research, guidelines for companies need to be elaborated which support them in working out their business plans for industrial product-service systems, showing them how to use the business planning instruments. Furthermore, these first consideration need to be connected to the topics of detailed business plans which allow companies willing to innovate their business model to in-depth analyze the consequences of change.

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