On the Sluggish Adoption of Total Cost of Ownership Business Models - An SDL Perspective

Jörg Freiling, Kathrin Dressel & Sven M. Laudien

It is rather undisputed that in recent times the economy is to a large extent a service - and maybe even more - a knowledge driven one. The service-dominant logic concept points to the pervasive service nature of business concepts and transactions and their dominance. This would suggest a high level of openness to innovative service solutions in general. We focus on the 'Total Cost of Ownership' concept, the obstacles from the customer's point of view and the long and uncertain way of final adoption.

Our paper advances research in three ways: First, we connect the phenomenon of a sluggish adoption of innovative hybrid business models with service-dominant logic reasoning. Service-dominant logic thinking opens the door for a better understanding of imperfectly designed business models. Second, we shed additional light on organizational purchasing decisions in the context of cognitive biases. Third, we give empirical evidence to support our viewpoint.

Keywords:
Service Innovation, Total Cost of Ownership, Service-Dominant Logic, Cognitive Biases.

INTRODUCTION

The service-dominant logic (henceforth: SDL) stresses the shift from a value-added perspective focused on the production and the supply of goods to an economy pervaded by service principles (Vargo & Lusch, 2004, 2007 & 2008). In their seminal article Vargo and Lusch (2004) highlighted the long but continuous transition of the value-added paradigm. Notably, the SDL focuses the way value-added processes are arranged and organized. It is not their primary ambition to point to the character of the final result, e.g. aspects of (in-) tangibility. Otherwise, we could raise the question why not stressing the up-and-coming economic significance of information and knowledge. In SDL thinking, all these aspects are already considered. Thus, the SDL largely rests on embodied knowledge and competences, mirrored in the so-called 'operant resources' that are of utmost importance to this way of thinking.

The - oftentimes long - transition in the value-added logic explains why innovative service solutions make their way to a final adoption while temporarily challenged by market resistance and problems of profitability at both sides of the transaction ('win/win constellations'). Still, in many instances it is quite uncertain whether, when, and how far inventive concepts with a strong service touch will be adopted after all. Performance contracting solutions are one example in this respect (Buse et al., 2001) more recent business model innovations in the realm of total cost of ownership (henceforth: TCO) concepts are another. In this paper, we focus on TCO concepts (Morssinkhof, Wouters & Warlop, 2006) and their long and uncertain way of final adoption.

In this respect, we can regard TCO business models as service solutions when specifying their very nature. To practitioners, this view is sometimes a little bit strange since the core of the offering is typically a package of tangible items in connection with a remarkable amount of intangible services of the different kind. Thus, many researchers preferred to speak of 'hybrid solutions' (Johansson et al., 2003). In fact, this seems to be a good semantic compromise. Nevertheless, as for the very nature of the transaction the 'serviceness' (Shostack 1984, 1987) is rather evident. This gives rise to the impression that we can employ the SDL to better understand the real nature of these transactions. So doing, we analyze the TCO adoption process in terms of SDL. In this respect, we focus on business-to-business (henceforth: B-to-B) settings in mechanical engineering where this question is currently of pivotal interest.

The research question of our paper is: What are the key obstacles to TCO adoption from a customer's point of view and what can be done to make these obstacles overcome?

To date, we know little about these obstacles. One reason for this is the simple fact, that service innovation management and the buying process of innovative service solutions has received little attention so far. To respond to the research question, we analyze in the next section the context of purchasing innovative hybrid solutions in closer business relationships. To this end, we consider research on organizational buying processes and the customer/supplier interaction (Griffiths et al., 2001). Although TCO business models come along with the concrete opportunity to save long-term costs of the customer, many of them are not willing to make a final decision on TCO adoption. We find out that, obviously, cognitive biases (Tversky & Kahneman, 1974) occur in organizational buying. In connection

with groupthink they help to explain why many TCO models finally fail. Against this background, we develop a system of research propositions.

In the follow-up section, we refer to the output of an empirical survey we conducted in 2010 and 2011 and employ the qualitative and quantitative findings to check the propositions outlined above. Our dataset enables us to better understand the relevance of service in general and full service offerings in particular in the context of industrial services.

The next step intends discussing the findings and drawing first conclusions. Thus, we analyze our findings based on the elements of a business model in order to identify the most important cornerstones for improvements of TCO models. We finish with a section on the limitations of our paper and discuss needs for further research.

Our paper advances research in three ways: First, we connect the phenomenon of a sluggish adoption of innovative hybrid business models with SDL reasoning. SDL thinking opens the door for a better understanding of imperfectly designed business models. Second, we shed additional light on organizational purchasing decisions in the context of cognitive biases. Third, we give empirical evidence to support our viewpoint.

OBSTACLES TO TCO ADOPTION - AN OPEN SYSTEM PERSPECTIVE

It is rather undisputed that in recent times the economy is to a large extent a service - and maybe always more - a knowledge economy. The SDL concept points to the pervasive service nature of business concepts and transactions and their dominance. This would suggest a high level of openness to innovative service solutions in general. Surprisingly, whenever we

take a look at B-to-B settings many new concepts such as performance contracting, full service contracts, BOT models, TCO concepts face serious problems in the adoption process. More, some of them fail after all. Why is it so?

We take a look at this question by focusing the most recent debate on TCO concepts in mechanical engineering. We chose mechanical engineering for several reasons. First, mechanical engineering is a rather international industry with only little obstacles to trade. Thus, the markets are predominantly liberal and the state does not significantly intervene in the market process. Second, the intensity of competition is high. Due to the fact that many firms are small businesses there are many players in the market. Third, many attempts have been made in mechanical engineering to introduce new business concepts. Fourth, the level of market transparency is rather high so that we can well observe the market processes from the researcher's viewpoint. Since TCO actually came to an issue, we henceforth analyze the adoption process against the background of obviously severe obstacles to innovation. Fifth, the necessity of lowering the total costs of a machine, not just the costs directly related to the purchase but also the costs of repair and maintenance, operating, re-vamping and so on has come to an issue in mechanical engineering in most recent times (Houshyar, 2005). So doing, we employ SDL to find an explanation by this concept although at first glance SDL's propositions and its basic reasoning do not seem suggest the persistence as for new business concepts in the market.

Before we start, we briefly highlight the very nature of the TCO concept to better understand the cornerstones to be mirrored in SDL terms. The term 'total cost of ownership' means the estimation of all direct and indirect costs related to the use of a technical asset

over its entire life cycle (Dahut 2008). Heilala et al. (2006) specify that TCO considers all life-cycle costs, including acquisition and procurement, operations and maintenance, and end-of-life management. This, however, does not exactly reflect the nature of TCO in B-to-B transactions in general and in mechanical engineering in particular. TCO solutions offered to business customers rest on four cornerstones: (a) an *integrated package* of both tangible and intangible items tailored to the individual needs of a customer; (b) a *contract* that specifies the risks to be taken by all the parties involved; (c) a *business model* that rests on a specific value proposition, a concept of value co-production of the supplier jointly with the customer, and a transaction model; (d) a *promise* to reduce customer's life-cycle costs (Enparantza et al., 2006; A. T. Kearney, 2003; Ellram, 1994). TCO intends to bring to the attention of a customer that a higher acquisition price is compensated by lower costs in later phases of the life-cycle (in particular maintenance, employees, services, energy) (Ellram & Siferd 1998). It suggests that from a somewhat 'rational' point of view TCO allows for increasing efficiency. Since organizational buying processes rest on expertise of different disciplines and of people from different hierarchical levels, one might expect a high interest of buying centers when TCO offerings come to an issue. Obviously, things seem to run differently.

It may be true that costs and cost savings play a prominent role within the TCO concept. However, we should not under-estimate the other cornerstones as well - and in particular the performance delivered, the way of customer/supplier collaboration before and the resources in use. Moreover, we need to take into account that TCO concepts can imply a high degree of organizational change from the customer's point of view so that costs and efforts of coordination might matter when making decisions on TCO adoption. By now,

astonishingly little (Roodhooft et al., 2003; Degraeve et al,. 2005; Ellram, 1994) has been said about these problems.

Next, we employ two different concepts that are highly complementary. First, we regard customers and suppliers in markets as open systems that interact with market partners and other parties of the business environment. Yet, there are different concepts that help us modelling firms as open systems. Since we are interested in particular steps of the value-added process in connection with the use of resources, we employ the open system view developed by Sanchez and Heene (1996) and adapt this view to our other concept: Second, we refer to SDL (Vargo & Lusch, 2004, 2007 & 2008) to address the service-oriented way of thinking.

We start out with raising the following question: What does the SDL tell us in the context of our research question? Having responded to this question we introduce the modified open system view in more detail and use this re-conceptualization for the purpose of developing research propositions.

The SDL points to a transition that is close to a paradigm shift in the Kuhnian (1970) sense in regarding value-added concepts (Vargo & Lusch, 2004; Lusch & Vargo, 2007). The SDL stresses the way how value-added processes and market transactions are arranged. ‘Sense and respond’ as a principle replaces the logic of ‘make and sell’. The single customer and the single supplier interact and co-produce what the customer really wants. It takes a high level of empathy of the supplier to patiently analyze and finally understand what the customer’s problem really is. Having well understood, both parties are in a much better position to co-

produce and co-develop whatever the problem might be. This requires a mutual openness and, thus, calls for an open system view to model it. More than that, the design of a value-added system implies an integration of the customer in the sphere of the supplier. Resources of both parties interact and allow for synergies that cannot be raised within the scope of a good-centered logic. As Vargo and Lusch (2004) argue, it is not important what the final outcome of the value-added process really is. It is much more important how the process of co-development proceeds. The relevance of resources (in particular 'operant' resources) and processes of the two involved parties replaces the former relevance of the good. Furthermore, we are well advised to shift our attention from the performance delivered to the utilization process of the customer, (pro-)actively supported by the supplier.

The SDL goes along with some organizational consequences as well. The most striking feature is that services are typically sold in a governance structure apart from the market. It was up Vargo and Lusch (2004) to outline that service transactions take place in a 'hybrid' constellation between the market and the hierarchy in the sense of Williamson (1985). We share this rather novel feature of services for a semantic reason. The term 'service' originates from a relationship between a principal and a 'servant'. We should not misinterpret this role by a too hierarchical understanding. However, we should be aware of the fact that service providers work on order principles. This order is a hybrid institution as well: it blends the hierarchical style of 'order and order fulfillment' with market-based principles of customers and suppliers making free decisions. Thus, we consider the blend of market and hierarchical modes of governance a centerpiece of the service nature in terms of SDL.

Next, we relate the SDL items to the open system view. In their original model, Sanchez and Heene (1996) focus on one firm, namely a supplier striving for sustaining competitive advantage. The entire system consists of six system elements: the strategic logic, the management processes, the intangible assets, the tangible assets, the activities, and the products. The open system is surrounded by external benchmarks (e.g. consultants), the so-called 'firm-addressable resources', and the market. Employing the SDL perspective as outlined above, we need to modify this system considerably. Figure 1 portrays the open system view of the supplier and the customer. Both form a temporary unit that seeks to collaborate on a formerly agreed basis. As a hybrid governance design this unit can last rather long if customer and supplier feel committed within the scope of a business relationship that pools part of the value-added resources and processes.

- insert figure 1 about here -

The character of the firm as an open system is indicated by the dotted line of blurring boundaries of both customer and supplier. The openness allows customer integration into the supplier's sphere for the purpose of co-production and co-development on the one hand and supplier integration to support the process of value co-creation in the firm of the customer on the other. In all instances, the customer and the supplier are able to integrate external advice, expertise, and resources by collaboration with third-parties. Insofar, they need an absorptive capacity (Cohen & Levinthal, 1990) to effectively monitor these processes. Moreover, the customer and the supplier as well learn in the market process by every step they make. Thus, they receive a feedback on every move. This feedback might have an impact on all elements of the open system.

Based on the embeddedness of the two firms in their business environment, we can find out first reasons for a slow pace of adoption novel concepts in industrial service markets. First, the more the two parties act separately, the worse the adaptation will be. Resources do not fit together well and prevent the partners from raising economies of scope. It is undisputed that in most cases TCO business models are customized offerings (Schuh et al., 2007). If this holds true, a minimum of adaptation between the parties is useful to trigger synergies. In case of TCO many customers behave in a too autonomous manner. They do not adapt to the supplier, restrict the contact and the interaction processes and do not involve themselves in a way that they fully understand all the details of a successful cooperation. The loose way of coupling prevents the customer from raising a relational benefit.

P1a. A low level of customer integration leads to a lack of customer/supplier adaptation and an insufficient use of TCO profit opportunities.

P1b. A low level of supplier integration leads to a lack of customer/supplier adaptation and an insufficient use of TCO profit opportunities.

Similarly, we can argue as for learning processes - in particular the learning of the supplier when making TCO offerings in the market with humble success. The suppliers are often not fully aware of the situation the customer faces. Research on organizational buying behavior and on customer/supplier interaction suggests many and rather different people participate in buying processes. It is vital to identify those people who have a considerable impact on the final decision and to find out ways how to communicate with them. This requires a careful analysis of the buying center as for structure and the processes items. This analysis

allows recognizing organizational resistance to buying decisions and problems of organizational change. Without this information suppliers are in a bad position to develop a winning sales strategy. Insofar, suppliers need to gather information every time they get in touch with customer personnel and to structure this information in internal ICT systems. Moreover, they need to stimulate learning processes to finally find out the decision criteria and the obstacles to innovation in case of novel TCO concepts.

P2. The more the supplier is able to gather and process information on the customer and to learn from every contact, the more the supplier is able to service a solution that is acceptable in terms of buying from a customer's point of view.

Next, we take a look at the internal system elements of both the customer and the supplier. The structure of the system elements differs from the Sanchez and Heene (1996) system considerably. For the sake of a parsimonious model we modeled a system element that represents the 'steering unit' of a firm. It is made of the dominant logic of the firm in terms of Bettis and Prahalad (1996) and the related managerial decisions. A dominant logic helps to select information and to separate 'relevant' from 'irrelevant' information. The logic is shared at least among a group of people and is dominant insofar as it serves a general frame of reference in case of decision-making. We consider in particular the customer's dominant logic crucial in case of TCO adoption. We can learn from prospect theory (Tversky & Kahneman, 1974) that people - be it in groups or individually - make decisions based on certain heuristics (representativeness, availability, anchoring). What is crucial in this respect is the simple fact that sometimes alternatives are completely over-estimated while other alternatives are under-estimated. As for the case of (sluggish) TCO adoption, we know that

in ‘rational’ calculations, payments are discounted to make them comparable. Besides that, concepts like TCO suffer from an additional ‘emotional discounting’. When customers make decisions they are often skeptical when it comes to issues of organizational change. TCO might go along with new roles for the own maintenance teams. Moreover, it is possible to outsource parts of the staff when making TCO contracts with the supplier. Insofar, powerful people in buying teams voice their skeptical viewpoint in an open or hidden manner. These aspects may all be considered in the decision-making routines, such as the dominant logic.

P3. Cognitive biases of decision-makers of the customer influence the dominant logic and lead to a systematic underrating of TCO concepts which lowers the pace of adoption.

We do not differ among tangible and intangible resources. Although we are aware of the fact that some intangibles (e.g. brands, technologies, competences) often make the difference in competition, there is - beside the typical claims (e.g. Hall, 1991) - simply not general proof for a general superiority of intangible resources. Thus, we model the resources as one system element. Moreover, we think that the differentiation among ‘operand’ and ‘operant’ resources according to Vargo and Lusch (2004) is much more meaningful than the one among intangibles and tangibles. Due to their basic role in value-added activities we consider the availability and use of ‘operant’ resources critical to TCO adoption. As Dierickx and Cool (1989) argue, continuous resource building raises so-called ‘asset mass efficiencies’. The more both supplier and customer are involved in TCO projects, the better is the chance to raise these efficiencies and, thus, to trigger critical mass effects. This holds true for the resources of the customer and supplier stand alone and for co-specialized assets as well.

Unless a certain mass is not reached, TCO concepts are not in a position to unfold their potentials.

P4. A low pace of resource building relevant to TCO of the supplier and the customer prevents from raising the full benefits and thus leads to a sluggish adoption of TCO concepts.

Sanchez and Heene (1996) modeled the activities and the products as two different system elements of the supplier. In case of thinking in SDL terms we agree on considering the process structures of the supplier. The product or performance, however, is a system element that belongs to the customer's sphere, as figure 1 outlines. More than that, the SDL emphasizes the oftentimes under-estimated usage process of the customer. We share this point and consider it by devoting a particular system element of the customer to these usage processes. More, we take into account that these usage processes can be fueled by the process structures of the supplier. If the supplier intensively takes the chance to support the usage process, it will definitely cause additional costs. However, at the same time the key learning effects associated with supplier integration bring the supplier in a better position to improve his TCO concepts and to foster his own TCO adoption.

P5. Lacking supplier participation in the usage process causes customer skepticism toward TCO concepts, dysfunctional learning processes and, finally, a low pace of TCO adoption.

Till now, we developed a modified open system view in the light of SDL and directed to the slow adoption of TCO concepts. In the next section we confront our research propositions with reality.

QUALITATIVE AND QUANTITATIVE EMPIRICAL ANALYSIS

Our empirical analysis rests on two pillars. Due to the complexity of purchasing TCO solutions and developing TCO business models, we rest upon case study research (interviews). Due to the idiosyncrasy of case studies and the small numbers problem we conducted a quantitative survey as well to better understand selected core factors of TCO adoption we identified in the explorative case study research. This procedure is in line with literature (e.g., Edmondson and McManus, 2007). According to Eisenhardt (1989) iterative research strategies are appropriate for topics that are rather insufficiently researched.

We began in December 2010 with designing the case studies. The process started with the identification and selection of adequate companies, the first steps of collecting the data, and the development of a semi-structured set of questions to be discussed with the interview partners. We carried out an in-depth case study according to Yin (2004) to gain a deeper understanding of factors in the realm of offering full service solutions, in particular TCO concepts. The investigated company offers hot melt adhesives and application technology in B-to-B settings. We first conducted five in-depth interviews with two company internals from the sales department (one manager, one consultant both are in-house staff), one field staff person (he works in the 'external' sales department and is responsible for one of the areas) and two customers (in the area of the field staff person). We conducted the semi-structured interviews following an interview guideline developed based on typical principles in literature (Lindlof & Taylor, 2002). We chose this procedure to apply scientific principles and to ensure comparability of the answers. Each interview was conducted face-to-face with the firms' employees and customers. Thus we were enabled to identify issues that were interpreted differently. This allowed us to go deeper as for these critical aspects. Each of the

interviews lasted more than one hour. For the sake of quality assurance we recorded each interview and made transcriptions that were carefully reviewed afterwards. In the face of the results we carefully reviewed the interview guideline and made adaptations whenever things seemed to be not totally clear.

On the basis of these five interviews we developed a questionnaire for an online survey that contains besides some general aspects (e.g. turnover, employees, line of business, attentiveness) questions about the way of making buying decisions, the customer relationship, the degree of customer satisfaction, ways for improvements, etc. The length of the questionnaire was intentionally kept to less than 15 minutes for the sake of a high return rate. Moreover, we offered to participate in a raffle and win an Apple iPad to encourage participation in the data collection effort (Linsky, 1976).

We sent an e-mail including the link to our online questionnaire to more than 3,400 customers and one reminder one week later to all the customers who have not filled out the questionnaire, yet. We received 371 answered questionnaires what means an effective response rate of 10.7 percent. In the questionnaire we employed four different types of options to respond. Mostly we used a seven point Likert-type scale (1 = negative, very bad; 7 = positive, very good).

To check the propositions with our data it is necessary to take both the qualitative and the quantitative empirical data into account. As for checking the propositions, we developed an interview guideline and in particular a questionnaire in a rather parsimonious manner so that only a few indicators of the causal relationships could be considered. The reason for this

is the intention not to overload our respondents with the survey. As the research on our research question is still in a rather early state, we are aware of the fact that more empirical work is necessary and modifications as for the indicators of our constructs are mandatory.

The first set of propositions (P1a and P1b) is about the level of customer/supplier integration what means that both sides should cooperate in terms of mutually granting access to resources to obtain better results. Thus, the supplier needs exact specifications from the customer and considerable input of the customer's staff in order to tailor the machine to the individual needs of the customer (co-production and co-development). Oppositely, the customer expects the supplier to involve actively in setting up the machine and supporting the customer's maintenance crew to implement TCO principles. Thus, it is very important for the supplier to understand exactly the customer's needs and internal circumstances of purchasing and using the machine. This requires an intensive interaction between the customer and the supplier. Thus, we asked for the people involved on the customer's side when buying machines. Typically, organizational buying processes are managed by a so-called buying center (Robinson et al., 1967; Webster & Wind, 1972). In the buying center several persons have an informal impact on the final decision, others are - often additionally - equipped with formal power and authority. Thus, we asked who is involved in processes of decision-making. Notably, the number of people is restricted and in many instances the purchasing authority is devoted to only one person, typically the department manager. This statement was made in one of our case studies as well. The interview partner said: 'Well, normally we have to make group decisions in cases of high investments but this way is often too difficult and time consuming. We think that our group leader has a lot of experience and therefore we trust him when he decides such things'. Obviously, the interaction between the

customer and the supplier is restricted, at least in early phases of cooperation. In such instances, both customer and supplier integration are restricted and do not reach an intensity that is useful to TCO adoption.

The second proposition refers to the ability of the supplier to tailor a solution to the customer that matches the specifications. Not astonishingly, innovative service concepts will not be adopted when the customer orientation is missing. In particular, we asked our respondents from the customer's firm: 'Why did you choose this supplier?' The respondents had to rank eight response categories by priority. The criterion 'service' ranks at the top with a mean score of 7.2, followed by 'price', 'flexibility', 'from a single source', and 'customer orientation' with a mean score of 4.4 TCO only takes place at the backseat (rank 7) with a mean score of 3.2. In connection with the above finding of a low customer involvement in the buying process, the results reveal that people are not well informed about TCO and do not consider these concepts relevant as for their usage situation. They demand services but the way of service provision is much more about the delivery of single service items and not delivering a complete solution like TCO. Since customers operate on a basis with remarkable capacities in the maintenance section, they are often convinced to handle problems of their own and to adapt solutions on their own account. In SDL terms this means that they rely on their own 'operant' resources instead of nurturing a pooling of the resource endowment with their preferred supplier. This, however, explains a low speed of TCO adoption to a large extent since this procedure prevents the partners from raising synergies.

The third proposition touches on cognitive biases that influence the dominant logic of the decision-makers of the customer. These biases can lead to an underrating of TCO and in the end to the rather slow pace of adoption. We find a close link to the first proposition for

cognitive biases appear more often when only one person is involved in the decision-making process. This finding is confirmed by one of the interviewed persons. He described the hot melt application technology market as ‘complex’ and told that they nearly always buy the application technology needed taking into account the long-term relationship with the supplier. He stated that often only a few people are involved in buying. Facing the fact, that many of the purchasing decisions are made with severe time pressure and rather limited information it turns out that these processes are prone to cognitive biases. Due to cognitive biases people tend to decide based on heuristics, in particular representativeness heuristics, availability heuristics and the anchoring heuristics (Tversky & Kahneman, 1974). In this context, Oliva and Kallenberg (2003) point out that very often decision makers do not consider a service contract for maintaining a machine as important as the machine itself. In this context cost savings of TCO solutions are systematically underrated. Thus, decisions on TCO solutions often go along with cognitive biases and make agreements on TCO contracts more and more unlikely.

The biases do not seem to be rational at first glance since TCO concepts are often superior in terms of cost and/or benefit. At second glance, it turns out that different logics are in use. The more focused logic centers on the initial buying decision, the wider logic on the whole usage of the technical infrastructure. We know from management theory that a deeply employed and dominant logic (Bettis & Prahalad, 1995) is hard to replace. In case of TCO adoption this is exactly one of the core problems of suppliers. So customers as teams with many opponents have to change their dominant logic before a TCO purchasing decision is possible.

The fourth proposition can be researched and explained by reference to the Daimler TCO business model. Daimler accumulated considerable market power and is, therefore, in a position to steer a supplier of machines in a manner similar to internal departments so that a state of quasi-vertical integration (Blois, 1972 & 1980) is reached. Daimler prefers to buy machines on an explicit TCO basis so that Daimler can calculate all costs until the end of the lifecycle of the machine. Due to the quasi-vertical integration and the 'sweat shop'-like atmosphere, the problem with this business model is that there is no real cooperation between Daimler and its suppliers. It is more a contract that enforces penalties in case of the supplier not complying negotiated terms of trades and standards. Thanks to their dependence on Daimler a lot of suppliers are worried about this way of doing business since TCO terms of trade often distribute risks in a rather asymmetrical manner. Thus, the skepticism of the suppliers prevents the partners from resource building based on close and trustful interaction (Corsten & Kumar, 2005). The lacking openness for bilateral resource pooling lowers the development of 'co-specialized resources' that could make TCO a 'win/win approach'. Oppositely, it transpires that the more both Daimler and the supplier work together, the better is the chance to economize on TCO and to accelerate the TCO adoption process.

The fifth proposition touches on the supplier participation and integration and, in particular, on the usage process of the customer and the cooperation of both parties. In business practice, there is often little cooperation of supplier and customer and, thus, little integration. The case studies reveal that this holds true in our research setting as well. Both customers remarked that they wish to have more information, more cooperation, individual consulting as for the products and the services as well. One of the customers said 'in the

beginning of the relationship there was a much closer contact to the supplier and a better exchange of information'.

As outlined in figure 1, customer integration in the supplier's sphere is mandatory for the purpose of co-production and co-development on the one hand and supplier integration to support the process of value co-creation in the firm of the customer on the other. This model helps both sides developing communication channels and trust, which is expected to lead to performance improvements.

DISCUSSION

Are ill-defined TCO business models a core reason for the slow pace of adoption? The findings outlined above suggest that in particular the skepticism of customers prevent a higher acceptance of TCO adoption. However, it seems that this is not the whole truth. From a marketing point of view, it is part of the marketing concept of the supplier to proactively identify barriers to adoption and to design a model that clearly outlines the value-added from a customer's point of view. Insofar, we need to analyze the business models of the suppliers to identify critical aspects to be considered in terms of SDL thinking that improve the chances of TCO adoption. To start the discussion, we systematically touch on the three building blocks of business models one by one (Timmers, 1998): the value proposition, the value-added architecture, and the profitability and sales model.

Value proposition. It seems to be a rather common problem of TCO business models that value is often understood as a given phenomenon. The SDL, however, suggests that value is

co-created. This implies forming a temporary unit of both the supplier and the customer. The value emerges from the joint value-added process and continues to grow my mutual effort of both parties in the usage phase. What is to be proposed in case of value proposition? Empirical evidence suggests that it is mainly a long-term concept, not to say a vision, how the customer is able to capitalize on TCO. This concept is to be specified in terms of effectiveness and efficiency measures.

Value-added architecture. Oftentimes, suppliers focus on internal value-added processes and try to put them into a cohesive whole. What typically runs short is considering the integration of the customer and the numerous adaptations between the two partners. This, however, ignores the very nature of services and SDL. It is simply impossible to design services without taking notice of the customers' wishes and the specific situation they are in. Insofar, SDL (Vargo & Lusch, 2004) as well techniques such as service blueprinting (Shostack, 1987) remind us to take the integration of the customer in the supplier's sphere into account. The same holds true the other way round for the supplier must be aware of the customer's usage constellations in order to cut total costs of ownership considerably and to ensure an attractive profitability of the respective project from the own point of view. Thus, designing the value-added architecture is necessarily a task devoted to the temporary unit formed by the single customer and supplier.

Profitability and sales model. In this part of the TCO business model the supplier needs to define a way of payment (e.g. pay for performance) and a concept how to contribute to profitability. Whereas sales information run into this part from the value proposition cost information stem from the value-added architecture. To integrate them, is integral part of

the profitability model. Once again, many business models are simply supplier oriented. What is needed for the sake of TCO adoption is a clear concept how the TCO contributes to mutual gains of the supplier and the customer as well. Moreover, the supplier has to sense a mode how to design the sales model in such a way that it is attractive from the customer's point of view. As for profitability, it is important to actively involve formal deciders of the customer in the purchasing process to ensure a sound positioning and a realistic perception of the own offering in the mind of the customer.

LIMITATIONS AND OUTLOOK

So far, we made first steps to better understand the slow rate of TCO adoption. We have first empirical evidence. However, we are still in a rather early step and need to conduct more explorative research to specify the core causalities. To date, most of our propositions seem to have empirical relevance. Nevertheless, we are still far away from testing hypotheses.

The paper demonstrates the usefulness of the SDL. It brings a different way to regard the business, here the TCO service business, to our attention. By employing an open system view of the customer, the supplier, and the temporary unit made of by the two parties, we are in a promising position to better locate problems of value-added processes.

REFERENCES

A. T. Kearney 2003. Finding new answers to the pricing question. Chicago.

Bettis, R. A. & Prahalad, C. K. 1995. The dominant logic: retrospective and extension. *Strategic Management Journal*, 16(1): 5-14.

Blois, K.J. 1972. Vertical Quasi-Integration. *Journal of Industrial Economics,* 20: 253-272.

Blois, K.J. 1980. Quasi-Integration as Mechanism for Controlling External Dependencies, *Management Decision,* 18: 55-63.

Buse, C., Freiling, J. & Weissenfels, S. 2001. Turning Product Business into Service Business: Performance Contracting as a Challenge of SME Customer/Supplier Networks, Conference Proceeding, 17th IMP Conference, Oslo.

Cohen, W. M & Levinthal, D. A. 1990. Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1): 128-152.

Corsten, D. & Kumar, N. 2005. Do Suppliers Benefit from Collaborative Relationships with Large Retailers? An Empirical Investigation of Efficient Consumer Response Adoption. Journal of Marketing, 69(7): 80-94.

Dahut, K. 2008. Total cost of ownership analysis. Bridging the operations and acquisition gap can help strengthen defense programs and their budget justifications. *Armed Forces Comptroller*, 53(3): 33-35.

Degraeve, Z., Labro, E. & Roodhooft, F. 2005. Constructing a total cost of ownership supplier selection methodology based on activity-based costing and mathematical programming. *Accounting and Business Research*, 35(1): 3-25.

Dierickx, I. & Cool, K. 1989. Asset Stock Accumulation and Sustainability of Competitive Advantage. *Management Science*, 35(12): 1504-1511.

Edmondson, A. C. & McManus, S. E. 2007. Methodological fit in management field research. *Academy of Management Review*, 32(4): 1155-1179.

Ellram, L. 1994. A taxonomy of total cost of ownership models. *Journal of Business Logistics*, *15(1): 171-191.*

Ellram, L. & Siferd, S. P. 1998. Total cost of ownership: A key concept in strategic cost management decisions. *Journal of Business Logistics*, 19(1): 55-84.

Enparantza, R., Revilla, O., Azkarate, A. & Zendoia, J. 2006. A Life Cycle Cost Calculation and Management System for Machine Tools. 13th CIRP International Converence on Life Cycle Engineering.

Griffiths, J., Elson, B. & Amos, D. 2001. A customer-supplier interaction model to improve customer focus in turbulent markets. *Managing Service Quality*, 11(1): 57-67.

Håkansson, H., (ed.) 1987. Industrial Technological Development: A Network Approach, Croom Helm, London.

Hall, R.H. 1991. The Contribution of Intangible Resources and Capabilities to Business Success. In: *Journal of General Management*, 16: 135-144.

Heilala, J., Helin, K. & Montonen, J. 2006. Total cost of ownership analysis for modular final assembly systems. *International Journal of Production and Research*, 44(18/19): 3967-3988.

Houshyar, A. 2005. Reliability and Maintainability of Machinery and Equipment, Part 2: Benchmarking, Life-Cycle Cost, and Predictive Maintenance. *International Journal of Modelling and Simulation*, No. 205.

Johansson, J.E., Krishnamurthy, C. & Schlissberg, H.E. 2003, 'Solving the solutions problem', McKinsey Quarterly, 4(3): 117-125.

Kuhn, T.S. 1970. The Structure of Scientific Revolutions (second ed.), University of Chicago Press: Chicago.

Lindlof, T. R. & Taylor, B. C. 2002. Qualitative Communication Research Methods (second ed.). Sage Publications, Thousand Oaks, California.

Linsky, A. S. 1976. Stimulating responses to mailed questionnaires: a review. *Public Opinion Quarterly*, 39: 82-101.

Morssinkhof, S., Wouters, M., & Warlop, L. 2006. *Effects of providing total cost of ownership information on attribute weights in purchasing decisions.* KUL Working Paper No. MO 0601. Leuven.

Oliva, R. & Kallenberg, R. 2003. Managing the transition from products to services. *International Journal of Services Industry Management*, 14(2): 160-172.

Robinson, P. J., Farris, C. W., & Wind, Y. 1967. *Industrial buying and creative marketing.* Boston, MA: Allyn and Bacon.

Roodhooft, F., Hiel, G., Van den Abbeele, A. & Van Doveren, B. 2003. Optimised sourcing strategies using total cost of ownership. *Cost Management*, 17(4): 28-35.

Sanchez, R., Heene, A. & Thomas, H. 1996. Toward the theory and practice of competence-based competition. In Sanchez, R., Heene, A. & Thomas, H. (eds.). *Dynamics of competence-based competition*. University Press, Oxford: 1-35.

Schuh, G., Klotzbach, C. & Gaus, F. 2008. Service provision as a sub-model of modern business models. Production Engineering, 2(1): 79-84.

Shostack, G. L. 1984. Designing services that deliver. *Harvard Business Review*,62(1): 133-139.

Shostack, G. L. 1987. Service Positioning Through Structural Change. *Journal of Marketing*, 51(1): 34-43.

Timmers, P. 1998. Business models for electronic markets, *Electronic Markets*, 8(2): 3-8.

Tversky, A. & Kahneman, D. 1974. Judgement under uncertainty. Heuristics and biases. *Science*, 185(12): 1124-1131.

Webster, F. E. & Wind, Y. 1972. A general model for understanding organizational buying behavior. *Journal of Marketing*, 36(2): 12-19.

Vargo, S. L. & Lusch, R. F. 2004. Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1): 1-17.

Vargo, S. L & Lusch, R. F. 2007. From goods to service(s): divergences and convergences of logics. *Industrial Marketing Management*, 37(3): 254-259.

Vargo, S. L. & Lusch, R. F. 2008. Service-dominant logic. Continuing the evolution. *Journal of the Academy of Marketing Science,* 36(1): 1-10.

Williamson, O. E. 1985. *The economic institutions of capitalism: Firms, markets, relational contracting*, The Free Press, New York.

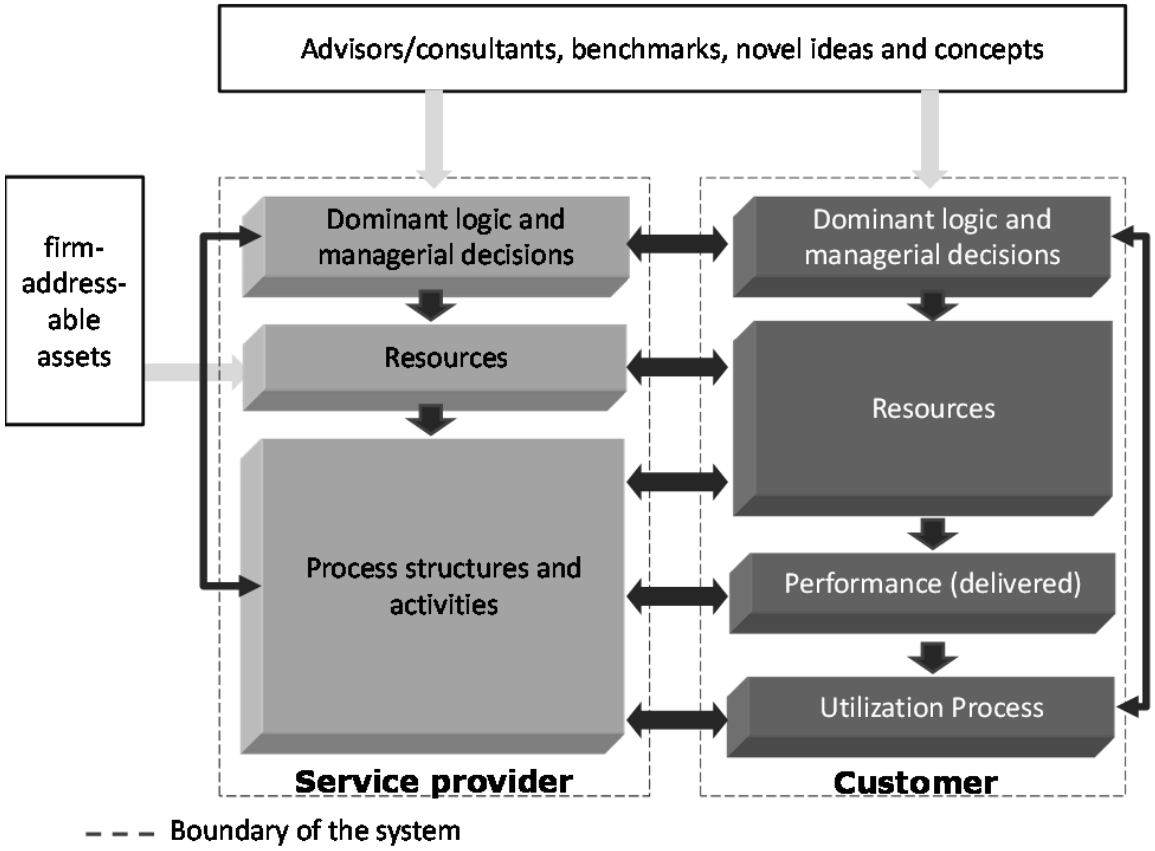

Figure 1: Modified open system view of the firm