

# STUDYING CUSTOMER VALUE CO-CREATION ACTIVITIES IN INDUSTRIAL SOLUTION BUSINESS

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## ABSTRACT

Solution business can offer new sources of income for traditional manufacturing companies, but the business model differs radically from the traditional product-centric view. One of the key differences is the depth of co-creation between the supplier and the customer. This co-creation covers the whole customer relationship, starting from the offering creation and continuing towards the end of the solution lifecycle. The booming academic interest on solution business has mainly focused on the supplying side of the dyadic relationship. As customer solutions are co-created, the views and opinions of customers form a fruitful research topic. The paper concentrates on how to study customer perceptions of value co-creation and relationship dynamics during the different relational processes in solution business. The study contributes to the growing solution marketing literature stream by providing methodological insights and a conceptual framework for customer co-creation activities in the relational solution process.

**Keywords: solution marketing, co-creation of value, customer solution, industrial service, abductive research approach**

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## INTRODUCTION

New business growth opportunities by providing solutions have encouraged companies to reorient their business logics. This can be seen particularly among the manufacturing companies. Industrial companies' value-creation potential is increased by moving up and downwards in the value chain. Offering "power by the hour" (e.g. Cohen et al. 2006) instead of separate products and service contracts can convert customer needs into profitable business and give new competitive advantage to industrial companies. This kind of business logic, referred as solution business, is often linked to the ability to create "unique value" (Miller et al. 2002; Davies et al. 2006). Brax & Jonsson (2009) argue that although this unique value has several attributes found in different studies, the common denominator is customer focus. Bundles of services and products created in cooperation with a customer, described as "customer", "integrated", "business" solutions, or "hybrid offerings", have recently received increasing interest in the academia as well (e.g. Nordin & Kowalkowski 2010; Ulaga & Reinartz 2011). This cooperation is emphasized also in the service-dominant logic (Vargo & Lusch 2004), which highlights the close cooperation relationship between the supplier and the customer (Lusch & Vargo 2006; Vargo et al. 2008). To be able to solve customer's problems with high satisfaction and success, suppliers need to possess profound knowledge on their customer's businesses. While this could be gained through effective and enduring relationships with customers (Shepherd & Ahmed, 2000), there seems to be a mismatch between the reality and literature: many of those calling themselves "solution providers" do not have extensive collaboration with their customers (Sawhney 2006).

Close co-operation between suppliers and customers is a key characteristic for solution business by its definition (Cornet et al. 2000; Sawhney 2006). As opposed to traditional view of product-centric and transactional supply of goods and services, providing solutions is seen as relational processes between the customer and the supplier (Tuli et al., 2007). However, previous studies on solutions have focused more on the supplying side. Although there has been a few customer-oriented research papers (e.g. Töllner et al., 2011; Brax & Jonsson, 2009; Tuli et al., 2007), we acknowledge a further need of detailed studies on customer perception of solution process in industrial business. This need of research on customer perspective of solution is acknowledged also by Tuli et al. (2007) and Jacob & Ulaga (2008). However, we would like to give our efforts first to properly build a research setting for our customer-oriented study.

Accordingly, the **purpose of the paper is to formulate an appropriate research setting for studying specific customer activities in value co-creation in the context of the complex and service-intensive industrial solution process.** The study contributes to solution business literature by advancing understanding on how a) customer perceptions of co-creation of value and b) value co-creation actions during the solution process could be studied. We address the following research questions: 1) How the relational solution process and solution co-creation should be studied? and 2) What aspects should be considered when studying the customer co-creation activities during the relational solution process?

The first research question is answered by discussing through different research approaches and methods. Then, the context-relevant literature is presented. Based on the literature, a preliminary framework for studying the co-creation process will be developed. The study begins with an introduction to the research approach and methodology literature followed by relevant literature on the topics of solution business, customer value, and value co-

creation. Finally, we will present our findings and summarize the results in the conclusions section.

## **RESEARCH APPROACH AND METHODOLOGY**

Quite a few research papers describe the utilized research approaches and methods only briefly. Often, also the reader might bypass this section with a brief overlook. Among logistics studies, only less than 4 per cent (14 of 378) of articles mentions the choice of inductive or deductive research approach (Kovács & Spens 2005). Based on their literature review Kovács & Spens (2005) assume that most of the papers lacking explicit discussion of research approach seem to follow deductive strategy. While the choice of research logic is an important issue of scientific rigor, the approach should be made clear to avoid any misunderstandings. In the following, we take a deeper look to find out what could be the most appropriate way to study solution business, and particularly, solution process through customer's value co-creation activities.

We believe that by looking beyond the data we can achieve stronger explanatory principles on the solution process through customer's value co-creation activities. To obtain this we need to borrow elements from both inductive and deductive research approaches. Already in 1878, Peirce (1878) presented three different modes of scientific reasoning, namely, deductive, inductive, and hypothesis ("abductive"). While deductive reasoning is drawing from general law to a certain case and inductive reasoning vice versa, Peirce (1957) sees most great advances in science as intuitive leaps that come forth as a whole. This process can be called abductive reasoning (Tayler et al. 2002). Among abduction approach, there are several different disciplines existing (Kovács & Spens 2005). Here, we refer to the parallel processing of theoretical foundation based on prior literature and the empirical analysis derived from case evidence to gain a holistic understanding of the focal phenomenon (Dubois & Gadde 2002). Abductive reasoning relates often to discussions of scientific discovery and problem solving. One method of abductive research logic is guessing, which results in hypothesis then tested with empirical data. As a subtlety, detectives are often claimed to utilize abductive reasoning while they are solving crimes (e.g., Josephson 1996). As our topic is relatively vast with unknown limitations about what value co-creation processes there can exist within solution business setting, we see that abductive reasoning could provide more insights than the more straight forward process of deduction. Hence, our research problem is examined by adopting abductive research logic.

We approach the customer's value co-creation activities through qualitative case evidence (Yin 2009). With having quite scarce quantity of different cases, we acknowledge, that the selection of appropriate case companies is vital (Dubois & Araujo 2007). Based on our research problem, we select business-to-business customer companies which have recently (= not later than one year ago) acquired rather complex customer solutions. The keywords here are time and complexity. By interviewing managers that only recently managed co-creation activities should lead to clearer overall picture of the sub-processes. And by focusing on complex solution business we anticipate to achieve a more holistic view by including the most possible sub-processes co-created in industrial solution business. All the case companies are industrial manufacturers.

The temporal dimension is a crucial factor (Halinen & Törnroos 2005) as the aim is to learn which processes have taken place during each phase of the four-stage solution process. The process nature of solutions could be studied by conducting interviews at certain intervals in

the actual passage of the time (Aaboen et al. 2012). However, to achieve a preliminary understanding of solution co-creation events, we start our journey by examining past events. For the data gathering, we adapt a similar method as Tuli et al. (2007). By using a focus group method, we are allowed to understand how people form shared conceptions on a particular matter (Morgan 1997; Barbour & Kitchinger 1999). We believe that collecting empirical evidence in a group setting allows participants to discuss and jointly reconstruct (Orlikowski & Yates 2002) the past events with better accuracy. There will be one group session organized in each of the firms followed by an email approval round for the results to eliminate possible misunderstandings. After the first empirical data gathering round we match our findings to existing theories and decide if there is a need for adjunct empirical data.

## **SOLUTION BUSINESS AS RELATIONAL PROCESSES**

The transformation from product supplier to solution provider has recently received increasing academic interest (e.g. Davies et al. 2006; Jacob & Ulaga 2008; Brax & Jonsson 2009; Nordin & Kowalkowski 2010; Salonen 2011). However, providing profitable solutions has shown to be difficult (Krishnamurthy et al. 2003). While examining the causes for servitization difficulties, one concept for describing the transformation, Neely (2008) pointed out the insufficient understanding of customer perception of value. It seems that a major challenge with previous literature is that most of it has neglected the customer focus (Tuli et al. 2007).

Customer is mainly interested in the value it receives and somewhat neglects how the supplier delivers it. Solutions are a way to deliver unique value to customers (Davies et al. 2006). The solution concept has a variety of definitions (Nordin & Kowalkowski 2010), many of which list merely the ingredients for solutions. However, within all these definitions, value can be found as the combining ingredient. According to Stremersch et al. (2001), solution is a “unique combination of numerous elements which will contribute to producing value for the customer” whereas the solution provider is “a supplier of complex offerings, delivering value for the customer in close cooperation with the customer”. In the context of traditional manufacturer companies, solutions are usually based on some sort of physical industrial element, for example, a paper machine. In addition, there are numerous types of service elements implemented in various phases of the solution life cycle (Artto et al. 2007). Solution business is about interacting with customers to find a suitable way to produce added value for the customer, for example by enhancing customer’s manufacturing processes.

The above mentioned definitions represent merely snapshots of solution elements. In practice solutions are longitudinal and relational processes. In their study, Tuli et al. (2007) presented a four-stage process-centric model of solution business. They argue that solution business is well in line with the service-dominant logic (Vargo & Lusch 2004) and the shift from transactions to relationships (Ballantyne & Varey 2006). According to Tuli et al. (2007), a solution provider must succeed in four process phases; *requirements definition (RD)*, *customizing and integration (CI)*, *deployment (DE)*, and *postdeployment support (PS)*. More recently, Töllner et al. (2011) proposed an extension for the solution process conceptualization. They included *signaling* in the beginning of the process and *inter-process management* as a base for other actions. However, Töllner et al. (2011) consider signaling activities something being performed by supplier. Furthermore, their second addition is also a collection of supplier activities. For this reason, we use the original conceptualization by Tuli et al. (2007) as a base framework for our study.

*Solution requirements definition* is time consuming. Customers often have difficulties in specifying the precise requirements for the solution. Also, suppliers should understand the surroundings of customer's business needs, both present and future, more comprehensively. This can be only done by cooperating before the actual offer specification. In the *customizing and integration* phase, suppliers have to adapt the customers' current systems and seek fully-working combination of different goods/services elements. *Deployment* phase refers to many possible further adjustments faced during the installation process, as well as training and other people-related aspects. Finally, *postdeployment support* expands over the traditional spare part and maintenance offerings by reacting with the customers' new demands and requirements. This final phase underlines the ongoing relationship characteristic of solution business. Tuli et al. (2007) present a well-argued relational solution process concept which is heavily co-created between the supplier and the customer. Before exploring the value co-creation literature, we first take a brief look at the customer value literature.

### CUSTOMER VALUE

The understanding of customer value is vital to business suppliers, and this is well echoed in the wealth of research attention dedicated to this area (e.g. Payne & Holt, 2001; Lindgreen & Wynstra, 2005; Anderson et al., 2006; Ulaga, 2011). Evolving from traditional product-centric view (Vargo and Lusch, 2004), customer value theory have been shifting towards relational view, where customer value is co-created in customer's processes as a value-in-use, through managing customer relationships (Vargo and Lusch, 2004; 2008; Ulaga and Eggert, 2006). Although scholars agree that customer value is a trade-off between all the relevant benefits and costs delivered by an offering through its lifetime (e.g. Flint et al., 1997; Ulaga & Eggert, 2006; Blocker, 2011), in practice customers and suppliers have often different perceptions about what constitutes value for them (Ulaga & Eggert, 2005; Anderson et al., 2006; Möller, 2006; Corsaro & Snehota, 2010).

Customer value is considered as a unique and context-bound subjective perception, determined by customer, not by supplier (Zeithaml, 1988; Vargo & Lusch, 2008; Corsaro & Snehota, 2010) and evaluated in relative to competitive offerings (Ulaga & Chacour, 2001; Anderson et al, 2006). Contemporary customer value research identifies three sources of value creation in industrial business relationships with their corresponding benefit and cost dimensions, illustrated in Table 1 (e.g. Cannon & Homburg, 2001; Ulaga, 2003; Menon et al., 2005; Ulaga & Eggert, 2005; 2006).

**Table 1. Value drivers in key supplier relationships (Ulaga & Eggert, 2006).**

Sources of value creation	Relationship value dimensions	
	Benefits	Costs
Core offering	Product quality Delivery performance	Direct costs
Sourcing process	Service support Personal interaction	Acquisition costs
Customer operations	Supplier know-how Time-to-market	Operation costs

However, majority of the studies exploring customer's perception of value in industrial markets have focused on companies providing physical goods (Cannon & Homburg, 2001; Ulaga, 2003; Menon et al., 2005; Ulaga & Eggert, 2006), whose value is often relatively straightforward to assess. In contrast, solutions are complex and service-intensive by nature,

making it difficult to assess their value objectively (Brady et al., 2005; Sawhney, 2006). Customers might perceive additional value dimensions in settings extending beyond traditional manufacturer-supplier relationships (Ulaga & Eggert, 2005), and preliminary research suggests that the value provided by solutions varies depending on contextual conditions (Worm, Ulaga & Zitzlsperger, 2009). In addition to the variety of exchanged products and services, providing customer solutions requires also constant interaction and reciprocal adaptation (Tuli et al., 2007; Windahl & Lakemond, 2010). Menon et al. (2005) noticed that joint working arrangements will increase the customer's perception of value, which highlights the importance of close co-operation and customer's active involvement.

#### CO-CREATION OF VALUE

Several studies (e.g. Tuli et al. 2007) emphasize the role of the solution provider as a facilitator and co-creator of value instead of a sole creator of the value. However, the academic knowledge of value co-creation is still developing (Woodruff & Flint 2006; Payne et al. 2008). Direct interactions with the customer's value creation processes are dominant when business is based on service logic. Like in any collaborative relationship, also in value co-creation of industrial solutions, there can be various motives for deeper collaboration. Solution provider's targeted benefits are typically related to creation of new business, to volume growth and to improvement of the competitive position. Client's targeted benefits are usually related to efficiency of its own operations and production process, and furthermore, networking of several service providers and customers generally aim to benefit from acquisition of resources and development of specific competences. Our focus here is to understand the customer side of the co-creation process.

Value-in-use thinking (e.g. Vargo et al., 2008) puts the focus on the customer's value creation processes and the auxiliary role of services in these. The deeper the aimed partnership in industrial b-to-b environment, the more important is the need for a detailed analysis of the value co-creation process. For example, in industrial maintenance services and solutions, the depth of the partnership may vary from a conventional transaction-based maintenance and repair work to performance partnerships or even to advanced value partnerships and full-service contracts and solutions (e.g. Stremersch et al., 2001). Our main interest is in these latter options. In this case the full understanding of customer value creation process is essential. The value creation process can include co-development of services and solutions (e.g. Alam, 2002; Thomke & von Hippel, 2002) as well as co-production of the solution (e.g. Brax & Jonsson, 2009).

The earlier studies and experiences of developing co-creation relationships between Finnish solution providers and their clients (e.g. Ojanen et al., 2010; Ahonen et al., 2010) have revealed some focus areas related to value co-creation of large industrial solution offerings: 1) Identification of the potential of the common value is essential to strengthen the customer perspective. The common value perspective is based on deriving the customer needs, potential benefits for the customer and benefits to the solution provider to a clear picture of mutual benefits. 2) Building a full understanding of the common value means understanding all the elements of value and their causal relationships as well as possible. Often the emphasis in related literature has been on the required capabilities of suppliers (e.g. Feeny et al., 2005), but in co-creation of value, it is also essential to note that customers should also develop and leverage their capabilities to fully understand the benefits, processes and cost structures involved. This understanding can be potentially promoted via moving step by step towards more advanced services and solutions. 3) Communicating the value in many cases may be the

most crucial step in the process. In complex and large solution entities, the amount of information and participating people is large. Therefore, systematic tools to construct the holistic view of the whole solution and to support the decision-making are necessary for structuring the message to all parties involved. 4) Realization of the common value by measuring the relationship development is also finally needed. The relationship evolves dynamically, and situations and participating people may change. In order to develop the mutual trust and the co-creation procedure, there have to be both qualitative and quantitative measures from both supplier's and customer's perspective.

If we reflect the above-mentioned discussion to the relational process perspective of solutions by Tuli et al. (2007), it seems that identifying the value potential, understanding the common value and communicating it are all essential already in planning of how to practically implement the co-creation, i.e. in *requirements definition* phase, and in *customizing and integration* phase. Monitoring co-creation process is essential in *deployment* and *post-deployment stages* to guarantee the realization of the value. When discussing about large, complex entities of solution offerings, there is a need to stress the front-end part of co-creation process, which is a prerequisite to succeeding in co-production of value and partnership during the whole asset life cycle.

To sum up, customers should be able to participate in each phase of the customized solution creation, from the *requirements definition* to *postdeployment support*, giving opportunities for mutual learning through dialogue (Ballantyne 2004). Payne et al. (2008) constructed a conceptual value co-creation framework with three components: customer value-creating processes, supplier value-creating processes, and encounter processes. Korkman (2006) argues that the customer uses practices as a set of routinized actions in a relationship. He suggests that the value is inside these practices and that the supplier should build value by improving these practices. Here, our interested is through which customer processes the customer organizes the co-creation actions relating to a specific solution process. The enhanced customer participation in the value creation process leads us to our conceptual framework for customer perspective of value co-creation in solution business.

#### CONCEPTUAL FRAMEWORK ON ANALYZING CUSTOMER VALUE CO-CREATION ACTIVITIES DURING SOLUTION PROCESS

Solution business means creating new business models and earning logics through innovative thinking between suppliers and customers. Based on the unique nature of solutions, the value co-creation process cannot be formulated into too constrained framework. As we focus on the customer side, we focus on customer processes. Our framework, see Figure 1, utilizes the four-phase solution concept by Tuli et al. (2007). Although they did not study their framework within manufacturers in capital goods industry, we believe their solution concept will offer a good ground for our research purpose. We seek for the actual processes customers undertake during the solution process. This is done by scrutinizing all the phases independently. We also divide the four phases into front-end (RD & CI) and back-end (DE & PS) phases. The front-end of solution process concentrates on the planning of the solution, while the back-end focuses on the execution and support activities.

The dyadic relationship between the supplier and the customer is dynamic (Håkansson, 1982). Hence, we will use the traditional IMP interaction model to analyze the relationship atmosphere during each solution process phase. The four atmosphere attributes are power/dependence, cooperation, closeness, and expectations (Håkansson, 1982). Here, the

power/dependence describes the power relation between the participants and its dynamics. Cooperation and closeness relates to the strength and volume of co-creation actions. Expectations are seen as value measuring efforts. Furthermore, we will attach iterative nature of innovation processes to our framework. The iteration possibilities are shown with arrows in our framework, see Figure 1. Possible iterations are needed when the actual solution is unclear at the beginning of the process – as unique customer solutions often are. Therefore, suppliers and customers will likely go back and forth when working together to find a suitable solution, especially during the front-end phases of the process. During the postdeployment support phase, customer needs might change or new technologies emerge which will lead to significant changes and thus, a step down in the solution process.

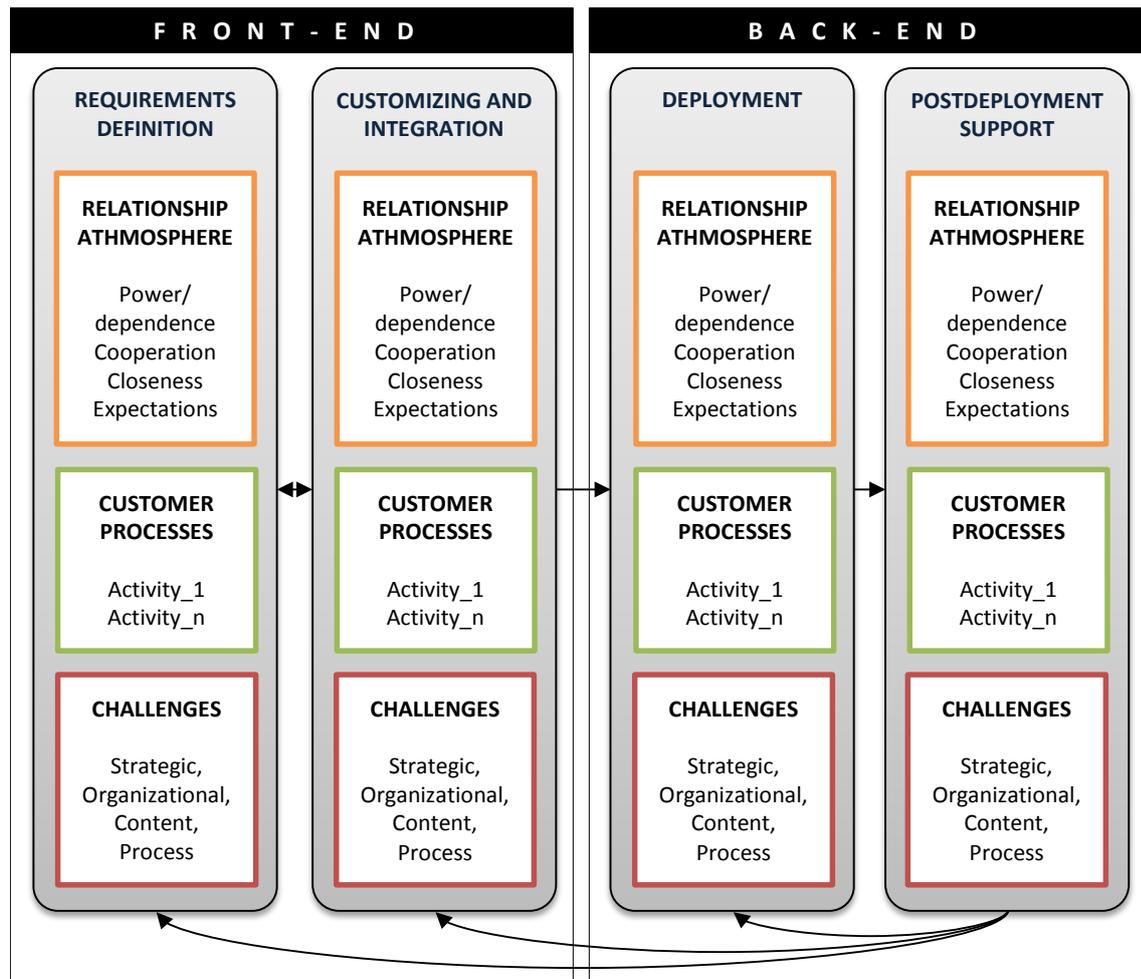


Figure 1. Conceptual framework on analyzing industrial solution process through customer's value creation activities

In the framework, we describe customer process activities (Payne et al., 2008; Korkman, 2006) and four types of challenges (Doz & Hamel, 1998) in each of the four solution process phases. Payne et al. (2008, p. 86) defines the customer's value creation process as "...a series of activities performed by the customer to achieve a particular goal". The activities can vary during the process from sharing information to measuring performance. Here, each activity is analyzed based on its strategic, organizational, content and process challenges to the customer (Doz & Hamel, 1998). The content-related challenges may exist throughout the co-creation process, but the focus of the content challenges may naturally differ from planning to implementation. In addition to relational process approaches, co-creation can also be linked to life cycle approaches. The co-creation as a whole can be seen as a continuous process that

is carried on throughout the lifecycle of the industrial asset, for example a large industrial equipment (e.g. paper machine) and variety of related services for this machinery, e.g. planning, support, training and maintenance services.

## RESEARCH FINDINGS

The purpose of the paper is to formulate an appropriate research setting for studying specific customer activities in value co-creation in the context of the complex and service-intensive industrial solution process. At this point of our research we have structured the research setting and a conceptual framework for our study.

The first research question, “How the relational solution process and solution co-creation should be studied?” was answered by presenting different research approaches with emphasis on the abductive reasoning logic. We claim that the parallel processing of theoretical foundation based on prior literature and the empirical analysis derived from case evidence helps us to gain a holistic understanding of the relational solution process. Hence we select abductive logic for our research approach. We also argue that the abductive reasoning could provide more insights than the more straight forward process of deductive reasoning. We also put importance to the temporal dimensions as our aim is to learn which processes have taken place during each phase of the four-stage solution process. However, the first data collection will be done by examining past events with a focus group method in order to obtain a preliminary understanding of solution co-creation events. If needed, this evidence can then be supplement with further efforts, perhaps by conducting interviews at certain intervals in the actual passage of the time.

The second research question was “What aspects should be considered when studying the customer co-creation activities during the relational solution process?” We answered this by developing a conceptual framework on analyzing industrial solution process through customer’s value co-creation activities. This framework was created by reviewing the relevant topics of solution business, customer value, and value co-creation. Our framework is based on Tuli et al. (2007) relational solution process concept. Within the framework, we included the traditional IMP interaction model (Håkansson, 1982) to analyze the relationship atmosphere during each phase. While collecting data for customer activities in each process phase, we use Doz & Hamel’s (1998) categorization for possible challenges occurred.

By utilizing the framework, we will be able to achieve valuable knowledge for example on the relationship atmosphere during the solution process. Starting with the front-end of solution process, we expect that the customer interaction and value co-creation efforts with the supplier are heaviest during the requirements definition and customizing and integration phases of the solution process. We also expect that these two phases (RD & CI) will be closely linked and involve perhaps multiple iteration rounds before moving on to deployment. The customer is also suspected to measure its perceived value by qualitative measures in the RD & CI phases. Finally, regarding to RD & CI phases, our presumption is that leadership will rotate from customer (RD) to supplier (CI). These four attributes will most likely alternate when moving towards the back-end of solution process. The deployment (DE) and postdeployment support (PS) phases are supposed to have quite straight-forward nature with less iteration. Also the co-creation activities might have a minor role in the DE phase, but it is supposed to strengthen towards the PS phase. Customer is expected to utilize both qualitative and quantitative value measurements in the back-end of solution process,

more précised ones especially during the PS phase. Furthermore, the leadership is expected to rotate from supplier (DE) back to customer (PS). Lastly, the final PS phase might invoke actions relating to some earlier solution phases, and thus starting the solution process at least partly again.

The framework obviously includes the actual activities taking place during the process. While it is unnecessary to speculate which activities there are and when they occur, we can hypothesize how the challenges might evolve over time during the process. In the front-end phases of the value co-creation process, the strategic and organizational challenges are assumed to be of most interest. Furthermore, during the back-end of solution process, there is need to overcome the challenges in sub-processes, in e.g. managing the processes of information and knowledge.

The results at this stage contribute mainly to the growing solution marketing literature stream by providing insights into methodological choices when studying the four-stage solution process. In the end, our aim for is to utilize this developed framework and research setting to discover customer's value perceptions and value co-creation activities in solution business. We expect that the results will clarify how customers view the value of a solution by identifying different value elements. Furthermore, the results will shed light on the co-creation of these value elements between suppliers and customers.

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