

DEVELOPING BUSINESS CUSTOMER'S VALUE PERCEPTION THROUGH SERVICE MODULARITY

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Abstract

The present challenge for many service firms is to develop an offering that is flexible and open for tailoring by the customers and at the same time achieve efficiency through standardizing processes. This is also the objective of service modularity that is an attempt to develop services by combining the flexibility of tailoring and the efficient production methods of standardizing. The concept became known as a production method of physical products, but recently it has raised interest among the service domain as well. The purpose of this research is to find answers to the following question: In what ways does modularity of services influence on the customer's value perception?

This study utilizes qualitative research approach and abductive reasoning. The research phenomenon is approached through a case study strategy. The case in the present study is a large provider of professional services involving construction, engineering, procurement and project management services and elements of these processes. Besides the representatives of the case company, also representatives of two of its customers were interviewed as well. Data gathering method was a semi structured theme interviews. In addition to the interviews, company brochures and websites and other such material are used as secondary sources of information.

As a conclusion, we argue that the internal service production systems of the service provider cannot ensure the goal-based value for the customer until they have enough long-term experience with the service provider. However, the relationship value is influenced by the value in the services outcome as well. The modular processes had an influence on the customer's expectations that are related to the experienced quality of the service, and hence they create value for the customer. In addition to the service outcome, the modular processes enhanced the customer's trust in the service provider's employees and their skills in co-operating in a suitable way during the service process. In this research it was also found that the organizational modularity eased the customer's tasks of managing the project implementation. Therefore, it can be said that the customers perceived value in the fact that they were better able to concentrate on the most important tasks and rely on the service provider with secondary tasks.

Keywords: Service modularity, customer's value perception, professional services, engineering services

Introduction

As companies try to develop their competitive skills and core capabilities they most often face decisions on whether to produce their own services or buy them (Fitzsimmons, Noh & Thies 1998). This has led to a remarkable expansion in the service sector in the latest years and therefore services' importance is becoming more apparent in various different industries. With increasing competition companies are pushed to develop their services in order to create value for the customers and service offerings that the customers prefer (Edvarsson, Gustafsson & Enquist 2007). However, that is a hard task especially for service sectors where the customer-base and the customers' needs are very heterogeneous. This is the case especially within professional business services, where the services have to be customized for each customer's individual needs. Therefore it is important that the service provider does not lose track of the customer's perspective when developing the services.

Thus, the present challenge for many service firms is to develop an offering that is flexible and open for tailoring by the customers (Edvardsson et al.), and at the same time achieve efficiency through standardizing processes. This is also the objective of service modularity (Pekkarinen & Ulkuniemi 2008) that is an attempt to develop services by combining the flexibility of tailoring and the efficient production methods of standardizing. The concept became known as a production method of physical products, but recently it has raised interest among the service domain as well.

The goal of the present research is to find out how service modularity enables creating value for the customer. Because modular services can be viewed as a tool for developing services (Pekkarinen & Ulkuniemi 2008) they provide a setting where the customer perspective in value co-creation can be explored. This is especially true in the case of b2b professional service providers; their way of operating is based on value creating services and therefore co-creating services is a way to co-create value. The purpose of this research is to find answers to the following question: In what ways does modularity of services influence on the customer's value perception?

This study utilizes qualitative research approach and abductive reasoning. While the customer's value perception and the relationship with the service provider is always unique and faced by different challenges it is inseparable from its context, it is therefore appropriate to choose a qualitative research method. The research phenomenon is approached through a case study strategy. The case in the present study is a large provider of professional services involving construction, engineering, procurement and project management services and elements of these processes. The company was selected for this research as its way of operating as well as its services can be interpreted as modular. Besides the representatives of the case company, also representatives of two of its customers were interviewed as well. Data gathering method was a semi structured theme interviews. In addition to the interviews, company brochures and websites and other such material are used as secondary sources of information.

Modularity in services

Modular service designs can be found in many service sectors, for example in educational and financial industries (Meyer, Jekowsky & Crane 2007). In their research Meyer et al. (2007) concluded that a platform design has potential for achieving efficiency in service production. In order to make the idea of modular services operational Pekkarinen and Ulkuniemi (2008) created a modular service platform. In the platform model modular service offering consists of service modules that are the visible part to the customer. In addition to the offering the customers are managed with customer interface modules, which include organizational and process modules. The interface modules can be, for instance, standardized manners of co-operating with the customers combined with customer-specific knowledge with which the interface can be customized. This way all the modular dimensions are actually made more visible to the customer (Ulkuniemi & Pekkarinen 2008).

The modular service platform consists of the three elements (modular offering, organization and processes) that are based on the service provider's knowledge and technology. The service provider can offer different services by combining the organizational and process modules in various ways in response to each customer's needs. Pine (1993) calls this loose-coupling; all processes can be linked to any of the numerous processes in the production system. In addition, it is possible to create new modules or improve the old ones to adapt to changing preferences of customers.

According to Pekkarinen and Ulkuniemi (2008) the benefit of platform thinking is that customization becomes easier and more cost effective when some of the modules already exist. Also, the service delivery becomes more profitable as service modules can be shared; e.g. the same truck can be used to deliver pipes and to deliver cement. Additionally, while modules are bundles of different service elements and processes, it is seen that modularity reduces complexity and therefore the management of a service system becomes easier. Finally, developing the service is facilitated, because each module can be improved separately from the other modules.

Also Hyötyläinen and Möller (2007) have represented modular service architecture. They argue that developing modular service architecture requires so called soft technologies, i.e. systemizing the intra-firm processes in order to avoid overlaps among all tasks (see Levitt 1976). In their research they found that modularity exists on a functional level, that is, services can be split into functions that need to be performed to produce a service and that can be utilized in producing many different services.

Therefore, in this study it is seen that in order to produce a service module the service provider needs to apply modularity in the processes as well. Also, because the present study is interested in professional services where the human resources usually play a central role, the modularity in organization is considered as an important factor in creating service modules. This is in line with Peters and Saidin (2000) who argue that organizational modularity is a prerequisite for achieving functionality in the modular service strategy.

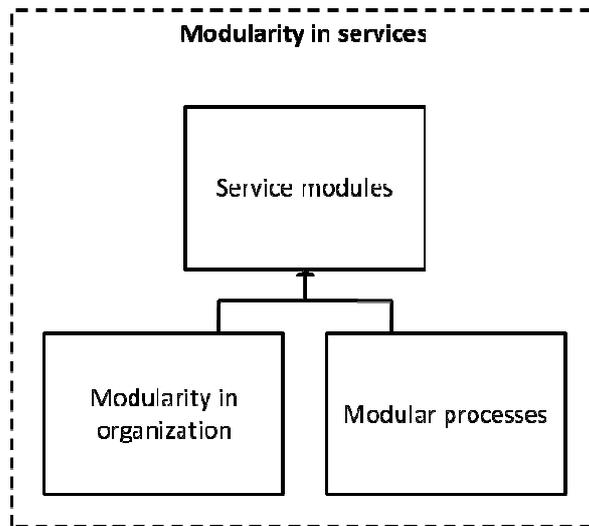


Figure 1. Formation of service modules.

In this research it is seen that employing modular thinking in services has requirements on the organization as well as its processes. This indicates that service modularity as a concept may be applicable only in certain contexts or industries. In the empirical part of this study we have interpreted that service modularity can be seen to exist in the case firm that offers professional engineering and construction management services. Before moving on to the case company description, the customer's value creation perception is discussed in the next chapter.

Customer's value perception

There are quite many different meanings of value in the business literature (see e.g. Flint, Woodruff & Gardial, 2002). Some of them describe the profitability of maintaining a customer relationship from the seller's perspective; some mean simply the values that are used as leading principles in companies' operations' and some try to describe the factors that benefit the customer and motivate them to be active in a relationship with their supplier or provider. Hence, the concept of value has not yet been fully established.

In this research we are interested on the customer's perceived value, that is, we want to know what elements in a service transaction create value from the customer's perspective. In this research we agree with Woodruff (1997) who determines customer value as customer's desires and beliefs of how they will benefit from buying and using a company's offering (be it product or service or something from between). Later on he specified the definition into customer value being the customer's perception of the product attributes (and evaluation of them) and the consequences of their usage, which influence on achieving the customer's objectives.

Some researchers define customer value as the match between the benefits received by using the offering and sacrifices offered in order to get access to it (see e.g. Zeithaml & Bitner 2003). In situations where the customer is unsure of the offered service quality they evaluate the price. In addition to the monetary sum of money, the customer's conception of the price is influenced by their non-monetary sacrifices. For example, if reaching the service requires very much effort and

time they may conceive the price too high. (Zeithaml & Bitner 1996.) The sacrifices have been mentioned to include everything from price and time to risks of failure and the benefits refer to the physical, technical and service related attributes (Ravald & Grönroos 1996) that somehow enable the customer to attain their objectives.

When the concept of value is being discussed, often the words quality and satisfaction are mentioned as related constructs and they are also referred to as indicators of value. Zeithaml and Bitner (2003) argue that satisfaction is the fulfillment a customer perceives when the service meets their expectations. Service quality, according to them, represents the elements of a service, e. g. reliability and tangibles etc., and they see quality as an element of satisfaction.

The value hierarchy model by Woodruff (1997) illustrates the underlying interdependencies of value, quality and satisfaction, where quality is a function of expectations and realized outcome, value is ratio between perceived benefits and sacrifices and finally satisfaction is the result of the customer being able to achieve their goals. According to the model, the customer can at the beginning of the interaction presume and expect some features or actions to occur during the delivery of the offering based on their prior knowledge and experiences. Later when using and consuming the offering they learn to appreciate certain attributes based on their ability to ease the reaching of desired consequences from usage situations. Finally, customers learn to value those consequences that relate to achieving their goals and purposes. In a similar manner, looking downward the hierarchy, customers learn to make connections between their goals and important consequences of usage situations, as well as observing which attributes are required to achieve desired consequences. The hierarchy model illustrates how customers construct their perception of value based on those attribute performances and achievements of goals in use situations that they prefer. It is noteworthy that customer satisfaction can be created on all the levels; hence lowest level satisfaction doesn't necessarily lead to goal-based satisfaction (highest level). Woodruff (1997) argues that the hierarchy model is a common framework for assessing customer value and an efficient tool for finding other than attribute-based values i.e. the factors which customers use as buying criteria.

Service modularity and customer's value perception

In order to find out, how service modularity enables creating value for the customer, we draw together the thoughts from the existing research on service modularity and customer perceived value, and propose a model of service modularity's possible influence on customer value perception illustrated in figure 2 below.

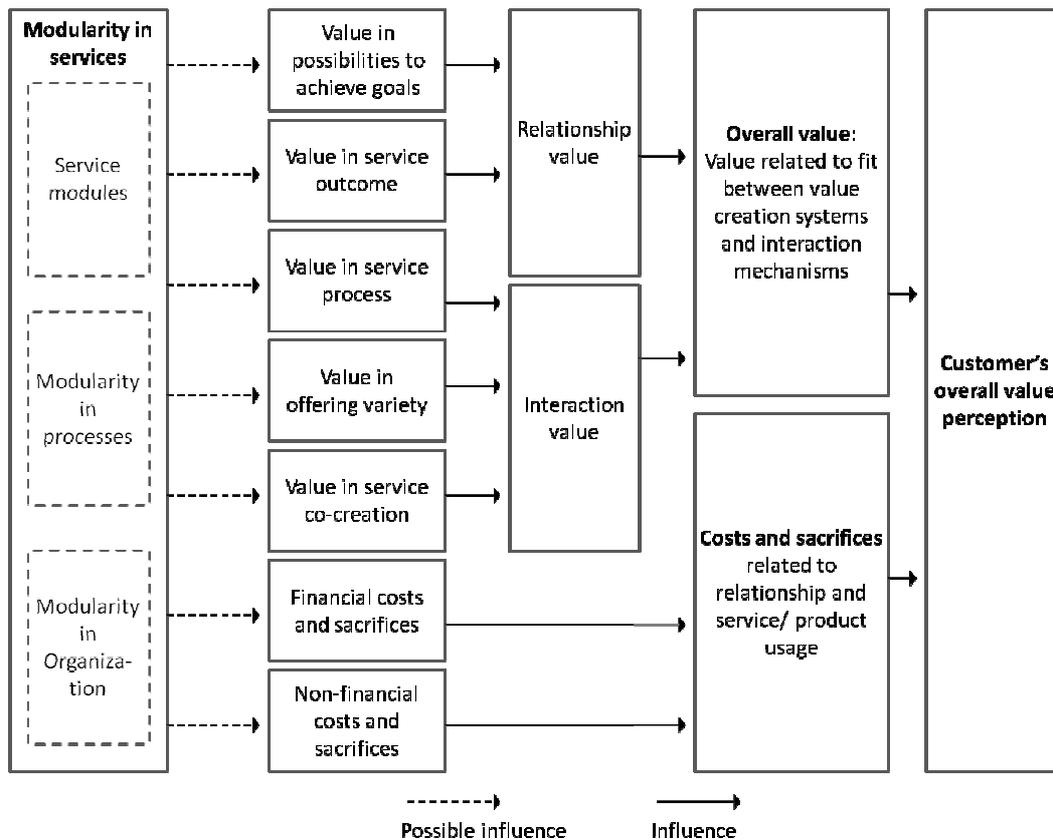


Figure 2. Service modularity's possible influence on the customer's value perception.

Modularity of services is placed in the far left box simply representing its influence on all value or cost elements. Service modularity is seen to include three elements: service modules, modularity in processes and modularity in organization (Pekkarinen and Ulkuniemi, 2008). Hence, it is expected that the empirical analysis will provide more insight into the meaning of the three elements, as well as their implications for the customer's value perception.

Porter (1988) argues that the customer's value is constructed of the *actions* that the customer performs in order to create value. Therefore, combining the thoughts on customer's value and the ways (actions) in which a customer can participate in value co-creation (see Normann 1991, Ennew & Binks 1991) and thus we identify the *value in service co-creation* –box in our model. The value in service co-creation represents the value that the customer can perceive in participating to the service production. In addition, it is an element of *value in interaction* because it is considered, in line with Woodruff (1997), as a service attribute, that is, the opportunity for customer participation (or customer inclusion) in service production is seen as a characteristic of the service. On the other hand, the *value in service offering variety* is partly overlapping with value in service co-creation, but their difference here is the customer's participation.

The *value in service process* means here the fluency of the interactions between the parties during the service delivery, which is interpreted from Woodruff's value hierarchy where he labels the second level as the customer's desired consequences in usage situations.

Woodruff (1997) in his value hierarchy placed achieving customer's goals on the highest level where the first two levels work as groundwork for achieving the highest level value. However, in this research a more practical view is taken and the *service outcome* is added to Woodruff's model as a pre-step for achieving highest level value. This is done, because according to Grönroos (1998) value is partly formed by service outcome, that is the engineering prints and their quality, which doesn't show in Woodruff's model. In fact, it is seen here, that Woodruff included the outcome and the goals in his view of the highest level value and here the two aspects are sub-divided. Furthermore, it is seen that the customer can evaluate *the possibility of achieving their goals* based on how the service provider has performed relating to the previously mentioned value elements. Here, these possibilities mean, for instance, the investment project's success, network benefits or reference value of the service provider. Thus *the value in relationship* is a construction of the result of the service process (for example a product) and the possibilities to use that result in a way that enables the achieving of customer's goals.

In conclusion, value in relationship and value in interaction are the elements of customer's overall value, that is created when the parties' value creation systems can better respond to each other and the co-operation is strengthened. However, the overall value perception of a customer can only be fully understood if the costs relating to interacting with the service provider and buying the service are also taken into account. Therefore, the boxes of non-financial and financial costs and sacrifices are added to the model. Now, the customer's overall value perception is formed as a match between overall value and overall costs.

Methodology

The objective of this research is to understand service modularity's influence on the customer's value perception and therefore a qualitative research method is used. Qualitative methods are interpretative techniques which describe and translate the meaning of natural phenomenon of the social world (Van Maanen 1983). Qualitative methods are useful when the existing body of knowledge is insufficient for posing causal questions and when the phenomenon cannot be separated and studied outside the context where it exists (Bonoma 1985). Since the literature on service modularity is scarce and because modularity in services is seen to exist only in certain service production systems the qualitative method is preferred in this research. Moreover, for the same reasons the *abductive* logic is chosen as the way of conducting scientific reasoning in this study. *Abduction* is a process of systematic combining, where the researcher's understanding of the phenomenon gets wider as she elaborates the related issues in turns and moving back and forth between the empirical and theoretical aspects (Dubois & Gadde 2002).

While the purpose of this study was to understand service modularity's influence on the customer's value perception the case study method was seen to suit well the study's object. In this study, choosing the case was done by theoretical sampling method, which aims at finding cases that represent the emergent theory (Eisenhardt 1989). Next we will present the criteria on which the case selection was based.

Firstly, the nature of the services had to correspond to our understanding on modular services. Therefore, the services should consist of clear modules, that is, they should consist of service elements and processes that separately offered would not create value but combined could be offered as one entity, that is, a service module. Secondly, it was considered that the selected services should be produced with a production system that enables process modularity and modularity in organisation. This is important, because in this research it is seen that these two are the prerequisites for service modularity. Thirdly, the company should have quite long and well established customer relationships so that we could get reliable experience-based responses on how the customers have perceived the modular services.

A technical engineering and construction designing services provider fitted our aforementioned requirements and therefore was selected as the case company for the empirical work. In the next chapter the case company and its services and customers are introduced more thoroughly. The data was collected through face-to-face semi-structured interviews. With a semi-structured interview method the interview questions are selected according to the theoretical framework of the study.

The empirical material was gathered from company representatives of the case company and its customers (see Table 1). First, the case company suggested six people from their organization who would have insight on the customer relationships and the service production process. The case company also recommended two interviewees representing the both customers who had participated in the service buying and project implementation, and later these individuals suggested others that could be interviewed as well. In this sense the snow-ball method was utilized as a partial data collection method. Altogether, five employees from the case company, and four employees of the customers' companies were interviewed.

Table 1. Interview data.

Organization	Position of the interviewee	Date / duration of the interview (hour:min)	
Case company (service provider)	Quality Manager	21.1.09	1:27
	Department Manager	23.2.09	1:41
	District Manager	5.2.09	1:08
	Office Manager	13.2.09	1:18
	Vice President, Project Management	27.2.09	1:38
Customer	Factory Service Manager	28.1.09	1:16
	Automation Specialist	5.3.09	1:19
	Large Industry Project's Owners' Representative and Production Manager	13.2.09	0:51

The interview sessions were recorded and transcribed. The transcribed interviews were analyzed with QSR N-Vivo 8 software that enables electrical processing of written data. With the help of the software the material was coded to represent the blocks in the theoretical framework. During the encoding, also

notes were made on all the ideas and conclusions that arose from the material. Finally, these coded stripes were reassembled and analysed utilizing the theoretical pre-understanding gained through the framework. In addition to the interviews, the case company's customer magazine and their www-sites were used as empirical material.

Overview of the case

In this section the empirical findings are presented. First, the case company is briefly described. The case company Engin (this is a cover name for the company) offers professional engineering and construction management services to manufacturing companies in forestry, energy, metal and chemical industries. Engin is a multinational group organisation with net sales of 700 million euro and over 7000 employees. In this research most of the empirical material (all but one interview) was gathered from its Finnish affiliate company which became a part of the global group by acquisition in 2007 and brought in its loyal customer base and, of course, its high technical skills.

The Engin's customers from small local to large global actors in the private or commercial sector turn to the company when in need of construction planning, engineering, implementation and start-up services. Most of the time Engin operates on a project basis as the assignments are in many cases related to investment projects of the customers. Although the company has many lasting relationships with their customers, it is quite rare to have strategic partnerships in the industry since most often the customers use competitive tendering for new projects. Engin offers basically all the technical designing and project management services that are needed when building or rebuilding a production plant or office facilities, for instance. Their services are to a large extent based on competence gained from previous projects and the employees' high degree of education. The services are extremely complex and risky while a failure in the structural designs may lead to serious malfunctioning of the building and cause danger to the workmen or even building collapses. In addition, the service projects are large investments and the implementation spans from one to two years which bring in monetary risks and emphasize the importance of the schedule.

In this research the concept of a service module referred to the smallest service unit that can be offered to a customer as such or as a part of a greater service offering. Having this definition, the service modules in the case company's clearly represent the different engineering areas: HPAC (heating, plumbing, air conditioning), electricity, automation, plumbing, process, plant and structure engineering etc. These became evident both in the case company and the customer interviews. Additionally, different project management, quality measurement and consulting services relating to the aforementioned engineering areas occur as individual service modules.

However, the extent and size of these modules can vary in relation to the customer's needs. In some cases the necessary engineering service concerned a single machine's foundations and in some cases the same service could address a whole production plant. In addition, the customer representatives who had become acquainted with the concept of modular services strongly questioned the modules' practical existence and their contractual meaning. In their opinion it is very difficult to create a service module that fulfills the requirements of service modularity. Instead, they interpreted the service modules' contents as internal work guidelines of Engin or saw that they were in one way a method to determine the contract's clauses. Despite the difficulties in defining the contents of a service module, Engin could utilize the existing modules in its internal development efforts. For instance, they could develop new services in another business line based on the service modules that exist in the other business line. Therefore, the modules existed and could be utilized in Engin's internal activities.

In this research modular processes are the invisible service process steps that need to be performed in order to produce a service module. At Engin these standardized processes clearly exist in their standardized ways of working and documenting the progress of projects which are based on the best

practice knowledge that has accumulated throughout the years in the organization. With the modular processes Engin can ensure the quality of their engineering designs and improve the compatibility and flexibility of different service modules. The company utilizes the modular processes not only in individual projects but also between their business lines.

Modularity in organization is defined according to the idea of loose-coupling and means, for instance, flexible allocation of company personnel or buying personnel leasing services. At Engin the modularity in organization becomes apparent in their organization structure and their large network of service sub-suppliers. Partially because of recent acquisitions Engin is structured in a de-centralized manner which allows quite free self government of the affiliates and branch offices. They have only four main offices globally but altogether there are hundreds of offices in 47 countries. This way Engin can provide a globally wide network of offices that can provide localized service while giving them support from the head quarters level at the same time.

In addition, the large organization enables the development of competence simultaneously with the daily operations. For example the standards and regulations for electric engineering change constantly and the engineers must stay up-to-date. However, instead of the big mother organization, the small offices are perceived more approachable by the customers and they also appreciate Engin's experience on the local conditions, e.g. language skills and knowledge on the weather conditions. Hence, it can be seen that with local offices a company can ensure flexibility in the organization that is also detected by the customers.

Besides organization structure, Engin's organizational modularity became apparent to the customers strongest with project management services where they had outsourced the procurement of sub-supplier services to Engin. The customers find that those services were related to Engin's professionalism and that the sub-suppliers were mostly on their responsibility which indicates that they were in a sense a part of Engin's organization.

Analysis of the modularity's influence to Case Company's customer's perceived value

In the following, we will discuss the three aspects to service modularity, namely the service modules, modular processes and modularity in organization, and how these were seen to influence on the customer's value perception.

Firstly, the *service modules* that could be interpreted in the case company's service offering were observed by the customers in the same manner as regular services. This was not surprising because the service modules had not been introduced to the customers as modules but instead as 'normal' services. However, some of the customer representatives knew quite well the concept of service modularity, and in their opinion it seemed impossible to create such modules in practice. They found that at the moment the concept brings so great requirements to the definition of services' contents that Engin has to be cautious when deciding to use the term of modularity in practice.

Therefore, based on the empirical research the service modules appeared to exist in the service provider's internal operations. Nevertheless, the modules were adaptable by size and by contents in a way that enabled creating different services flexibly. Thus, the modules become apparent to the customers in the flexible service offering variety even if the services aren't called, named or sold as modules but instead as regular services. Furthermore, the defining of the services', i.e. the modules', contents basically had an influence on everything else that would happen in the project. Therefore, the service modules were the basis for all quality evaluation, at least indirectly.

Secondly, it seems that the *modular processes* of Engin had the most apparent influence on the customer's perception on Engin and their services. The customers found that the stabilized processes could guarantee a certain service quality level. However, in their opinion the process standardization related mostly to the trustworthiness of Engin because Engin's long experience and best practice

knowledge was in one sense condensed to the processes. Also, the customers didn't mention any constraints that would have been caused by Engin's processes, which indicates that in their perception the standardized processes weren't too rigid.

Furthermore, the modular processes related also to the customer's trust in Engin's employees. It seems that the experienced customer representatives could evaluate Engin as a whole based on Engin's image and they found that they can quite easily overcome the problems that are caused by getting familiar with Engin's employees. On the other hand, the customer representatives with less experience didn't appreciate Engin's image in the market very much and emphasized individual employees' roles' influence on the projects' success. Therefore it can be said that the modular processes had an effect on how the customer evaluated Engin's organization but that the customer specific factors also influenced on it.

Thirdly, the way in which *modularity in organization* occurs at Engin was seen as a competitive advantage by the customers. The customers appreciated Engin's local presence and local competence. They also appreciated Engin's knowledge and professionalism on managing the sub-suppliers who were the project's implementers in practice. Because of the organizational modularity, Engin could save the customer's time and efforts in managing the whole service provider group and it can be said that the organizational modularity had an effect on the customer's role in the service production. Thus, modularity in the service provider's organization enables the decreasing of the customer's tasks in the project's implementation and in the service production.

However, also the customer's needs and internal resources were factors that strongly effected on the customer's role. Basically the customer's tasks depended on the customer's own decisions because they decided the project's extent and the restricting conditions within which the service provider's should operate. Furthermore, based on the interviews it seems that the customers always have to determine their needs and objectives for the project and that the determinative role cannot be outsourced.

Figure 3 illustrates the empirical findings and draws together the answer to the main research question. The figure illustrates the connections between the three aspects to modularity and the customer's value perception's elements.

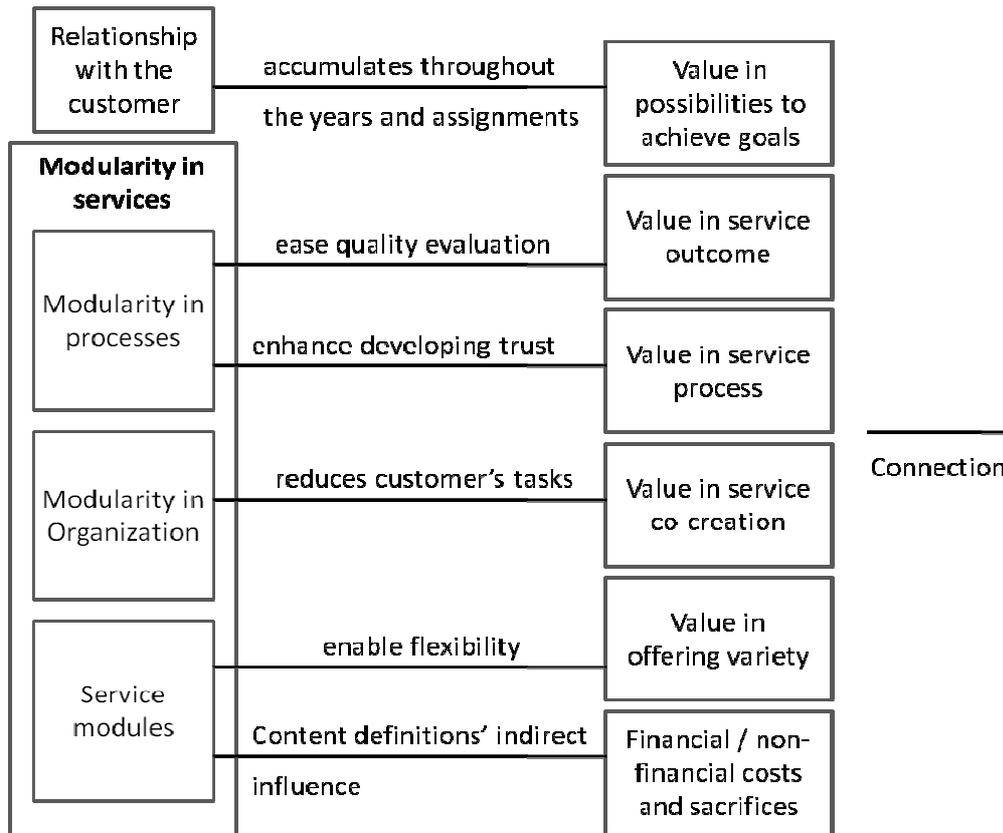


Figure 3. Service modularity's connections to the value criteria.

The above figure represents the modified framework that shows the empirically discovered results of this research. The connections between the modularity in services and the value elements represent the earlier introduced ways in which service modularity influences on the customers value perception. In addition, based on the empirical material it seems that the three aspects to modularity have no direct influence on the customer's possibilities to achieve their strategic goals. Instead, it appeared that the service provider's efforts in building the relationship in the long-term created trust between the parties. Also, although the costs and sacrifices of the customer occurred mostly due to the resources procurement or the personnel costs, in the end they all related mostly to the services' contents' definition and thus it is seen that the service modules have an indirect influence on them.

Conclusions

Based on this research it seems that the modularity in the offering, the processes or in the organization do not have a remarkable influence on the relationship between the professional service provider and its customers. The customer can evaluate the service provider's ability to assist in achieving their goals based on a long-term relationship where the customer can become convinced of the service provider's skills and values through many single assignments. Thus, the

results are in line with Woodruff's value hierarchy model (1997) in the sense that during the years the customers had learned certain ways of implementing a project and the service provider must prove that they can operate according to those practices (i.e. creating attribute and consequence based satisfaction). In other words, the internal service production systems of the service provider cannot ensure the goal-based value for the customer until they have enough long-term experience with the service provider. On the other hand, the relationship influenced the customer's willingness to try other service providers. Therefore, it can be said that in this case the customer perceived value in the relationship itself. Thus relationship building activities can add value to the customer (Crosby & Stephens 1987).

However, the relationship value is influenced by the value in the services outcome as well. The modular processes eased the customer's evaluation tasks relating to the service outcome, i.e. they could better evaluate the quality and accuracy of the cost estimations, prints, etc. before the actual implementation. Thus, the modular processes had an influence on the customer's expectations that are related to the experienced quality of the service, and hence they create value for the customer. Enhancing the service outcome's quality influences on the customer's perceived value (Grönroos 1998).

In addition to the service outcome, the modular processes enhanced the customer's trust in the service provider's employees and their skills in co-operating in a suitable way during the service process. This can be related to Lapierre's (1997) value exchange attributes. Lapierre has found that the customer perceives value in the responsiveness and credibility of the service provider, and in the service characteristics that represent partnership between the actors, which in one sense relate to the customer's trust in the service provider.

In this research it was found that the organizational modularity eased the customer's tasks of managing the project implementation. Therefore, it can be said that the customers perceived value in the fact that they were better able to concentrate on the most important tasks and rely on the service provider with secondary tasks. This can be related to Ennew and Binks' (1999) term responsible behaviour, which means the shifting of roles between the service provider and the customer. Thus organizational modularity, i.e. the flexible organization structure, enabled the customer in outsourcing their tasks. This result is similar with Ulkuniemi and Pekkarinen (2008) who argued that modularity could ease the customer's tasks in buying services. However, in this study it appears that modularity in services can increase the customer's willingness to outsource or buy more services from the chosen service provider, but modularity in services in itself doesn't overcome the challenges such as intangibility and perishability.

Based on this research it seems that by creating service modules a service provider can create flexibility in the service offering. Also, it seems that in the services domain the concept of flexibility is more widely usable than in the products domain where the tangibility brings constraints for example in the production machines and connectible interfaces. Based on this research it seems that with these professional services the standardization could be achieved without losing the ability to customize.

Finally, based on this research we found that the definition of a service module is a problematic task. As a contrast to products, a service module's contents can be altered during the customization or even later. Also, all processes of the service delivery are related to the service module's definition so if the content of the module changes, the processes need to change too.

This applies also to the costs of the service that the customer pays. In this research we concluded that the module's definition has an indirect (instead in direct) influence on the costs and sacrifices of the customer, because if there appear surprising but necessary changes to the service module the parties will discuss whose responsibility the occurred costs will be. However, in this research we did not explore how efficient the modular system was in the case company and thus we cannot conclude if it was cost-effective (that is one definition of service modularity by Pekkarinen and Ulkuniemi (2008) and whether the cost benefit got to the customers).

As the conversation on service modularity has risen in the latest few years, there has been a lack in research of the customer's perspective to modular services. In this research, on the grounds of the empirical case material it seems that service modularity does not appear to the customers in a different way compared to 'normal' services. However, some saw the engineering services as a part of their own processes and hence one could argue that the customers can see the modular services as a module in their own organizational modularity. Therefore, it can be concluded that service modularity can be seen as a service provider's internal method of managing complexity and developing flexibility into the whole system. Therefore, in one sense service modularity can be seen to come true as intra-company productization.

However, in order to speak of service modularity it seems that at least the modularity in organization (Peters & Saidin 2000) besides the modular processes have to exist in the service provider's operations in order to create and deliver modular services. Yet one might argue that the way in which modularity in organization appeared in the case company is simply an example of a de-centralized organization structure and outsourcing, and therefore the concept of organizational modularity would only be a new name for familiar concepts. In any case, in order to employ modularity in services a company has to ensure flexibility in the organization in some way, and therefore it can be argued that modularity in organization can be a concept that has a changing meaning in different industries and relates to the company's type of business.

It seems that the service modularity concept is a tool for developing services internally in a service company, i.e. a method of improving managers' thinking when they try to achieve efficiency and flexibility in their service production. Therefore, as in Hyötyläinen and Möller's (2007) and Meyer and other's (2007) research, also in this study it appeared that implementing modularity in services may require utilizing other service development methods as well. Also, it is noteworthy that service modularity as such is not a marketing effort and therefore other methods are needed especially for the marketing purpose.

In this research the case company had made effort to tangibilize the service by developing a project management concept that uses a four level database consisting of sets of functions, processes, tasks and deliverables. In practice the concept enables the visualization and definition of services interactively with the customer. Unfortunately, the concept launch is yet in its infancy and therefore we were unable to reach customers who had experience of the concept. Therefore, against Pekkarinen and Ulkuniemi's (2008) argument it seems that in this research the modular services could not relieve some of the customer's problems related to buying.

Also, although the modularity seemed to be an internal system of the service provider the improved service production methods' benefits should be communicated to the customers in an efficient way. In the case company the interviewed employees found that the successful projects were their best marketing tool. However, based on the research results it seems that developing

the services with a modular approach doesn't directly enhance the relationship between the parties. Deepening the relationship seemed to be an issue that was separate from the services value to the customers and that was very dependent on the nature of the case company's business. The results were consistent with Filiatrault and Lapierre's research (1997) which showed that project business usually entails managing the relationship in the long run as well as on a daily basis.

Also, Hellström and Wikström (2005) have argued that project based business models are a business area, where a demand for customized products (flexibility) and standardization of product and process architecture come across. Typical features of projects are usually mentioned to be temporal (i.e. discontinuity) and related to system integration (i.e. complexity). Discontinuity and complexity were recognizable features also in this case company's operations and they rather widely captured the elements that brought challenges to the company's customer relationships.

Moreover, this research's results are consistent with Filiatrault and Lapierre's (1997) work on consulting engineering services where they argue that along with the service product features (price, methodology, technical quality etc.) relational capabilities are evaluated by the customer and those may even be the decisive factor in provider selection. The relationship with the case company eased the customer's task of evaluating the possible service provider candidates, because personal contacts were stressed and previous experiences with the service provider gave information on their team work capabilities and thus tendency for conflicts was considered to be lower. In addition, as in Crosby and Stevens (1987) argue that a relationship can have an influence on the evaluation of the service's core features, and therefore a good relationship may overshadow some failures of the service.

With respect to managerial implications, while the service modularity wasn't observed by the customers in any divergent way, the results of this research show that the three aspects to service modularity have an underlying connection to some of the elements of the customer's value perception. Therefore, by adopting the modular approach as a service development method a firm can possibly address some specific value creation issues that they have experienced problematic in their operations.

Nevertheless, based on the empirical analysis it seems that modularizing the service offering is rather challenging for person-centred services areas, such as professional services, where the buying decisions are often made based on personal relationships between individual employees instead of objectively considering all alternatives. The customer interviews showed that at least the existing and long-term customers had a somewhat sceptical attitude towards the modularization efforts of Engin. In their point-of-view the modules were yet another marketing effort and they were also seen as a contracting method. Therefore, a service provider has to be cautious with to whom they will introduce the modularized service offering. It seems that the services' modularization can be more effective with new customers or customers that are not very knowledgeable on the services.

However, when service modules are being formed and the contents are determined there are some issues that have to be taken into account. For instance, it can be expected that the customers can evaluate the service modules on different terms than the "regular" services. In a sense defining the contents of the modules to the detail creates more specific expectations to the

customers at the same time, which creates greater responsibilities for the service provider. On the other hand, defining the modules' contents can make using new quality evaluation methods possible and hence the service provider can better justify their services' prices.

With respect to evaluation of the quality of the present study, we employed the concepts of validity and reliability of qualitative research. The term *validity* refers to the fit between the reality and the research's models, figures, concepts or theories and so on. In other words, validity describes the degree to which the researcher has successfully managed to study what he/she wanted to study. (Gummesson 2000.) According to Yin (1989) a research's quality can be evaluated by means of construct validity, external validity and internal validity that are discussed next.

Construct validity means establishing correct operational measures for the concepts being measured, i.e. the researcher uses subjective judgement to determine accurate measures for the chosen object-related concepts. Construct validity can be improved by using multiple sources of evidence and establishing a chain of evidence during data collection. (Yin 1989) Using many methods simultaneously to address a phenomenon empirically or theoretically is called triangulation. In this research the construct validity was tackled by gathering various types of empirical data: transcribed interviews, workshop discussions, one focus group discussion, and case company's written material (www-sites and customer magazines). *External validity* is about establishing a domain to which the case study's results can be applied (Yin 1989). In qualitative research this generalizability is seen to happen from the case to the theory (instead of the statistical sample of quantitative research). Therefore, the external validity refers mostly to testing the initial case's results in similar case settings and comparing them, for instance, in multiple case studies. However, this case study is about describing the unique situation in the case company and therefore the generalizations are drawn to the research on value creation in services instead of other cases (companies). Yin (1989, 40) argues that *internal validity* is more essential when trying to achieve causal relationships or explanations for them. This research aims to create understanding of the research phenomenon and therefore the internal validity is not considered to be an important evaluation criterion.

In addition to the validity evaluation we can evaluate reliability. *Reliability* describes the degree to which we would be able to replicate the study. Put in a more practical way, reliability is high if many researchers studying the same phenomenon and with the same objectives would end up having similar results (Gummesson 2000). Thus, the object of reliability is to decrease the errors and biases in a research. The reliability can be improved by carefully describing and documenting the research process; the idea is that anyone could do the same research based on the documentation. In the current study this was done by reporting the empirical research process as accurately as possible. Also, the transcription of the interviews and making notes of the workshops and meetings was done with the aim of improving the reliability. Therefore, the reliability was fostered through these actions.

Concerning future research avenues, as it was mentioned in chapter two, it seems that modularity of services is a concept that is suitable in certain industries and in certain business logics. Therefore, we would need more insight into the issues that determine whether a modular approach could be utilized in some industry or not. Additionally, another theoretical issue concerns simply the concept of modularity in services. At least until today there is no coherent meaning for the topic, and the suggestions that have been presented so far have been based on

modularity in products. Therefore, we need to specify the terms in which modularity differs between services and products. Also, in this research the empirical material was collected from the case company's long-term customers and therefore the results represent experienced customers' point of view. Hence, it would be valuable to study what perceptions new customers have on service modules and how the benefits of a modular service strategy can be visualized and communicated to the customers. In this research we did not explore how the modular service structure affected the efficiency of the service production. However, while the objective of developing services through modularity is to gain efficiency and flexibility, we would need to study the modular service production system's influence on the costs.

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