Knowledge sharing in innovative modular service offerings

Category of the paper: A research paper
Topic: Changed customer roles/service innovation

Abstract

Purpose - This paper explores what challenges can be identified in terms of knowledge sharing in modular service offerings of knowledge-intensive business services both intra and inter-firm contexts.

Method - The paper builds on value co-creation and knowledge sharing in service projects utilising modular service offerings of the knowledge-intensive organisation. An elaborative case study conducted in customer projects related to engineering, procurement, and construction management services depicts knowledge sharing between the service provider and customer organizations.

Findings - With the innovative service offerings provided, the case company's value provision is generated from its expertise as well as its capabilities in knowledge sharing (explicit and tacit) with its customer. Knowledge sharing between the units and experts located all around the world was seen as essential. The need to extensive knowledge sharing often resulted in emphasising personal relationships within the business relationships.

Implications - In inter-firm knowledge sharing the role of personal relationships is essential. The modular service offerings require that consideration should put to the quality and nature of knowledge to be shared with the customer. Standardization of the work and exploiting previous projects is a challenge in knowledge sharing.

Originality - The paper provides new information of the challenges of knowledge sharing in the case of the modular knowledge-intensive business services and highlights future research needs on modularity in service innovations and inter-firm knowledge sharing in professional relationships.

Keywords: customer role, modular service offering, professional service relationship, knowledge-intensive service

1 Introduction

The recent work of the Service-Dominant-Logic (S-D logic) in marketing (Vargo and Lusch, 2004, 2008; Journal of Academy Marketing Science 2008, Vol. 36) is based on the interest towards intangible resources and process management in services. The S-D logic can be seen as an integrator of the academic conversations in services marketing, relationship marketing and service operations management overlapping somewhat in regards to the perspective on customer-provider interaction and value creation in b2b context. For example, Filiatrault and Lapierre (1997) argue that the service provider and the customer need to create mutual understanding for the relationship by a learning process in which the provider learns about the firm and the industry and the customer learns about the technical and project managing aspects.

However, a research topic that has not gotten the attention it needs in b2b services research is the role of the customer as a value co-creator (Edvardsson, 2005). In

developing modular service offerings (modular innovations see e.g. Henderson and Clark, 1990; modular architecture see e.g. Voss and Hsuan, 2009) the firms have to do corresponding organizational rearrangements, to avoid a "trap" meaning that in order to benefit from modularity, also organizational structures, need to be adapted toward a decentralized organization (Chesborough and Kusunoki, 1999 in Nonaka and Teece, 1999 as well as Brusoni and Prencipe, 2001). Pekkarinen and Ulkuniemi (2008) point out that in the modular service offering the customer interfaces, the encounter processes (Payne *et al*., 2008) and the boundaries between the customer and service provider (Araujo *et al.*, 2003) need to be understood better. More specifically, the kind of information and knowledge that will transfer and share between the customer and provider needs to be carefully considered.

The use of modularity creates many challenges e.g. how to manage information and knowledge sharing and learning within the dynamic inter-firm context. The previous research related to Knowledge Management and knowledge sharing are mainly restricted to intra-firm topics (e.g. Davenport and Prusak, 1998; Alavi and Leidner, 2001; Mithas *et al.*, 2005) and there is a shortage of empirical research on sharing customer-related knowledge in professional organization's relationships (see e.g., Campbell, 2003; Kerkhoff *et al.*, 2003; Ballantyne, 2004).

Knowledge about customers is without a doubt an essential knowledge element in creating modularity; however, knowledge for customers is also needed in the process of relationship management (Gebert et al., 2002), meaning that in the best possible situation, customer needs are mathced with the best possible expertise available. It is crucial to know who knows what in the professional firm (e.g. Argote, 1999). Knowledge from customers, meaning feedback on services used earlier and/or general knowledge on prevailing and future customer needs, is an important aspect, whose exploitation is significant in the process of service development (e.g., Gibbert et al., 2002). All these elements of knowledge are important building blocks in expertise service modularization.

2 Purpose of the paper

The present study focuses on *value co-creation with the customer* in projects utilising innovative *modular knowledge-intensive service offerings* which are often complicated based on the professionalism and specific capabilities in problem solving. In this paper we explore what *challenges can be identified* in terms of knowledge sharing in modular service offerings both intra and inter-firm contexts. More specifically, we aim to find out, *what kinds of challenges can be identified in relation to:*

a) Intra-firm knowledge sharing in the service provider organisation.
b) Inter-firm knowledge sharing between the customer and the service provider.

At these two levels, we will analyse both tacit (invidual-bound) and explicit aspects of knowledge sharing. Through an elaborative case study conducted in a company offering professional services in customer projects related to engineering, procurement, and construction management services we show how knowledge sharing between the service provider and customer organizations can be developed by using the modular service offering.

3 Modular service offering of knowledge intensive services

Managing the complexity of knowledge-intensive business services in customization can be find through modularization, where services are seen as packages or bundles of modular pieces that can be combined into various customized services (Pekkarinen and Ulkuniemi, 2008). Modularization can also be defined as grouping functionalities which fulfill the same customer needs and are used in several services in one module (Hyötyläinen & Möller, 2007). However, bundling services without client's participation may fail, e.g. delivery channel is not right, the modules do not produce the mix of functionality, quality and price customer wants. As much as technology, especially IT innovations are important to modular services, also social and non-technological innovations are welcome (Aa van der and Elfring, 2002).

Benefits of the use of modular offerings in service development can be defined by two properties: *decomposition of the overall structure of a service* which are a set of benefits a service offer to a customer into defined functional elements describing the explicit structure of the service and *interface specifications defining how service modules will interact* with each other together within the service (Sanchez and Collins, 2001).

In service offering where modularization is used for *creating new service combinations within the customer interface together with the customer* the service design of a new modular service will also require the corresponding organizational changes. The customer as co-producer brings flexibility to the service provider, but also changes the roles of parties in the relationship and thus also the *need and methods of knowledge sharing in the inter-firm context.* Modularity prerequisites low coordination within a modular service architecture, however, in services the human touch-points with the customer are inevitable and need a special attention in managing information and knowledge transfer and sharing (Payne *et al.*, 2008).

Modular architectures can provide flexibility and adaptability in the customer's supply chain; however, the use of modularity necessarily lead to changes in organizational and supply network structures that need more attention in research (Araujo, 2006). One example of the organization modules is an adaptive team (Saarel, 1995) as a self-organizing structure of the knowledge transfer and sharing in service provision (Schilling & Steensma, 2001) creating value to the members in inter-firm relationships. The integration in supply chains can be made through the "orchestrator", the leading actor of the chain (Araujo, 2006; Dhanaraj and Parkhe, 2006); for example, the customer can determine the power-control balance both in customer-service provider relationships according its own sourcing strategy. Equally important factors for coordination are the nature of operational explicit and tacit knowledge, knowledge transfer intra- and inter-firm context and communication capability of tacit knowledge transfer (Spring, 2003).

4 Knowledge sharing

As the knowledge-intensive business services are often detailed and complicated service processes, they require more contacts with the customer to ensure adequate knowledge sharing. Because customer's motive to cooperate differs from that of employees, new capabilities are required for both intra- and inter-firm knowledge sharing. The

relationship between own personnel and customers as co-creators of value also needs tobe clarified (Pekkarinen and Ulkuniemi, 2007).

In general, intra-firm customer knowledge is collected from several sources and it is related to all of the firm's functions, and it can be used at different organization levels (Kohli and Jaworski, 1990). Rollins *et al.* (2009) emphasize that sharing customer knowledge between the buyer and the service provider should be a dialog between all the parties from the buyer's and service provider's side (Kohli and Jaworski, 1990; Mason and Leek, 2007).

Routines and many common rules can be codified and exploit and transfer efficiently through IT systems without human contacts. However, sharing tacit knowledge between the customer and the service provider require the personal, social interaction at several level of the organization. (Spring, 2003.) Human systems might also be able to redesign themselves and enhance organizational adjustments and joint learning (Spring and Araujo, 2009).

The elements and the processes in the modular service offering are clearly defined and more visible to the customer; hence, the role of the customer in the whole service process also becomes more visible. This helps the customer to take into account what is required from them during the service delivery. As a modular service offering helps a customer to manage the entirety of a broad and complex service, while on the other hand, it can create fragmentation, and can appear as a rather exhaustive process to the customer.

5 Method

This paper explores intra and inter-firm knowledge sharing in modular services of business relationships. The theoretical pre-understanding will be elaborated through a single case study of the service supplier with two sub-cases of its customers. The case company (professional service provider) offers engineering, procurement and construction management services to manufacturing companies in forestry, metal and chemical industries and also to actors in public sector and commercial construction. It became a part of a global group by acquisition in 2007 and brought in its loyal customer base and its high technical skills. The customers (from small local to large global actors) turn to the company when in need of construction planning, engineering, implementation and start-up services. Usually the service projects are large investments and the implementation spans from one to two years.

Data were mainly collected through semi-structured interviews with service provider personnel as well as managers from two customer companies. Different types of documents, e.g., customer magazines, company web sites, product brochures and a specific service product model software presentation were also proved as important sources of evidence and helped in triangulating interview accounts (Yin, 2003). Five persons from the service provider company were interviewed at the service provider and four persons from two customer companies (see Table 1). The interviews covered, quite broadly, issues around the customer-service provider relationships, project cycles and service processes. The interviews were recorded and transcribed.

Table 1 Interview Data

Organization	Status 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 Company A	Factory Service Manager	28.1.09	1:16
	Automation Specialist	5.3.09	1:19
Customer Company B	Large Industry Project's Owners' Representative and Production Manager	13.2.09	0:51

6 Empirical analysis

The service provider has developed a service product model (SPM) based on the company's best practices that was designed to combine the various dimensions related to their service project management. The aim was to create an interactive and customer-oriented generic service project management model modifiable to different customer needs and applicable to multinational and –cultural projects. Thus, with the SPM the case company's value provision is generated from its professionalism related to service projects as well as its capabilities accumulated from previous projects. The SPM enables the visibility and transparency of elements included in the service project easing the customer's buying process.

From the service provider's perspective the SPM justifies pricing decisions according to required resources and provides a tool for managing human resources by enhancing communicating the customer promise. The SPM enables a clear definition of the responsibilities of the parties involved. Basically, the model means that all the processes are carefully depicted in terms of what are included and who is responsible for each area and task. As a result of this model, the software in question produces up to 100 different documents automatically. With the innovative service offerings provided, the case company's value provision is generated from its expertise as well as its capabilities in knowledge sharing (explicit and tacit) with its customer.

The model itself can be seen as a form of modular service offering because if puts the whole service into smaller independent parts, into functions, processes, tasks and deliverables. In addition to the modularity identified in this new model, other types of modularity can also be found in the case company. For example, the organization of the company includes several internal companies, so the case company supplies some modules and tasks from other internal partners, and also offers modules to them. Project customer-specific teams with multi-skills members are organized after a decision by the customer about the service agreement/project has been made. Also, external parties are involved in the supply network of the case company, e.g., architects' services.

In developing the model, one of the driving forces has been the need to ensure a sufficient knowledge flow both inside the service provider organization as well as with the customer organizations and other partners. Typical challenge related to services

industry is the problem of specifying the service which actually can be seen as a kind of knowledge sharing problem. In addition to this, the basic feature of any project business, the uniqueness of projects and interest in standardising and copying parts of projects can be considered as a internal knowledge sharing problem. The following quotation aptly illustrates the two drivers of developing the kind of modular SPM model:

> "One of the main reasons behind developing the model was that we need to increase our visibility towards customers, what is included into our work, how the work proceeds and to agree upon these beforehand rather than arguing afterwards about the contents of the contract. Another aspect was the inner aspect meaning that typically in our business that a new project emerges we start to bounder about whether we have done something similar earlier with some customer and who from our side was involved." Vice President, Project Management

Internal knowledge sharing in modular SPM. In the case company, the internal knowledge sharing was considered as one of the key issues in successful business on the level of the whole company. This was evident for example in terms of modularity in the organization. The organizational modularity case organization becomes apparent in their organization structure and their large network of service sub-suppliers. Partially because of recent acquisitions the case company 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 they 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. Knowledge sharing between the units and experts located all around the world was seen as essential.

> "..There's one offering process going on in Denmark this week which I think is a good example of this flexibility. We have a small office there at that locality in Denmark that is used to doing thing with the customer but this time the project is so large that they don't have the resources. And the customer doesn't believe that the small office could handle it either. So we have cooperation between our Danish office and Finnish office. --- We maximize the things we can do there and then take some typical process managers or leaders from here. In a way we agree that that the project's responsibility is in here because it is so big. --- by offering this combination we believe that we have a better shot at getting the job. If we'd offer only from Finland I don't think it would be enough. And if we'd offer just from Denmark it wouldn't be enough." Vice President, Project Management

In addition to organizational modularity, knowledge chasing was important aspect also in terms of processes, especially related to the nature of project business. Knowledge sharing between different projects was seen as important. The case company had a long experience in the business and naturally they tried to take advantage of the knowledge accumulated over the years and projects. New projects were planned according to previous experiences but this was often considered difficult due to non existing database of the previous experiences. The knowledge actually was only attached to certain specific experts.

> "When copy-pasting the texts from old project plans to new project plans, there is always the risk that we have no clue whether there was a certain reason to do

> something in a specific way in the old projects. The reasons were not usually written in the project documents. Thus, this kind of copy-pasting of old texts could make things seriously wrong." Vice President, Project Management

The newly developed SPM model was seen as potentially very valuable tool in intra-firm knowledge sharing. However, in the company, the adoption of such model faced some difficulties. For example, in terms of the SPM model and the actual content of the software, it is essential that the experts of the company working in customer projects use the model and contribute also the content of the software.

Inter-firm knowledge sharing in customer interface. In professional services business, the knowledge sharing is an essential issue within customer projects. Firstly, in terms of defining the service and forming a common understanding of the content of the actual service exchange requires a lot of knowledge sharing between the counterparts in terms of customer needs and requirements, service provider's understanding of these and project implementation plans. From the customer organization, this process of defining the service as well as the whole service process usually requires a continuous decision-making and communicating these to the service provider. The customer representatives in the project often need to communicate the issues relevant to the decisions to the higher levels of the organization due to levels of authority within the customer organisation.

The need to extensive knowledge sharing often resulted in emphasising personal relationships within the business relationships. In complex customer projects, the customers often preferred to use the same service providers and specific experts in them to ease the problem of knowledge sharing. The well-known experts who the customers felt were familiar with the customer's needs were preferred.

> "Instead of going through extensive negotiations, we prefer just to call them [the service provider] and ask them to send a certain guy here. We will show him what he needs to do. It takes just an hour because he knows our systems so well" Factory Service Manager

The person centered way of ensuring the needed knowledge flow between the service provider and the customer company is of course potentially very risky for the both parties in case of personnel changes for example. In order to avoid these risks, the service provider tries to increase the use of the SPM software.

7 Conclusions based on findings and implications

With respect to internal knowledge sharing, in modular organization it is essential to develop means of sharing knowledge between the organizational units and experts. Especially within a professional services context, the existence of different types of expertise within different business areas is essential. Important knowledge to be shared inside a service provider firm is related to e.g. competencies that exist in the company in terms individual experts. Also, the standardization of the work and exploiting previous projects requires a specific type of knowledge sharing in the studied context.

In terms of inter-firm knowledge sharing, especially in the customer interface the role of personal relationships as means of knowledge sharing or avoiding the problem of

sharing knowledge in the service process was evident. In modular service offerings the knowledge attached to the service modules, e.g. in terms of offering variability may be something that actually needs not to be thoroughly communicated and shared with the customer. Complex services may be even more complex to the customer if every little detail need to be discussed. In fact, this illustrates that consideration should not be put so much into the amount of knowledge to be shared with the customer but more to the quality and nature of the knowledge.

This paper contributes to the discussion about the role of the customer as a value co-creator in the b2b relationship and the discussion of the challenges in knowledge sharing within professional modular service offerings. The study highlights the communication needs and challenges in intra and inter-firm knowledge sharing building the modular service innovations.

References

Aa van der, W. and Elfring, T. (2002),"Realizing innovations in services", *Scandinavian Journal of Management,* Vol. 18, pp. 155-171.

Alavi, M. and Leitner, D. E. (2001), "Review: Knowledge Management and knowledge management systems: Conceptual foundations and research issues," *MIS Quarterly*, Vol. 15, No. 1, pp. 107-136.

Araujo, L. (2006),"Modularity, systems integration and supply chain leadership", A Key-Note Speech at the 4th Worldwide Symposium on Purchasing and Supply Chain Management, University of San Diego, CA. USA.

Araujo, L., Dubois, A. and Gadde, L. -E. (2003), "The multiple boundaries of the firm," *Journal of Management Studies*, Vol. 40, No. 5, pp. 1255-1277.

Ballantyne, D. (2004)," Dialogue and its role in the development of relationship specific knowledge", *Journal of Business & Industrial Marketing*, Vol.19, No. 2, pp. 114-123.

Brusoni, S. and Principe, A. (2001), "Managing knowledge in loosely coupled networks: Exploring the links between product and knowledge dynamics," *Journal of Management Studies*, Vol. 38, No. 7, pp. 1019-1035.

Campbell, A. (2003), "Creating customer knowledge competence: Managing Customer Relationship Management programs strategically", *Industrial Marketing Management,* Vol. 32, pp. 375-383.

Chesborough, H. and Kusunoki, K. (1999),"The modularity trap: innovation, technology phase-shifts, and the resulting limits of virtual organizations", Nonaka, I. and Teece, D. J. (1999), *Knowledge and the Firm, Oxford University Press*, Oxford.

Davenport, T. and Prusak, L. (1998), *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press, Boston, USA.

Dhanaraj, C. and Parkhe, A. (2006),"Orchestrating innovation networks", *Academy of Management Review*, Vol. 31, No. 3, pp. 659-669.

Edvardsson, B., Gustafsson, A. and Roos, I. (2005), "Service portraits in service research: a critical review", *International Journal of Service Industry Management*, Vol. 16, No. 1, pp. 107-121.

Filiatrault, P. and Lapierre, J. (1997),"Managing business-to-business relationships in consulting engineering firms", *Industrial Marketing Management,* Vol. 26, No. 2, pp. 213-222.

Gebert, H., Geib, M., Kolbe, L. and Riempp, G. (2002),"Towards Customer Knowledge Management; Integrating Customer Knowledge Management and Knowledge Management concept", *The Second International Conference on Electronic Business*, December 10-13, Taipei, Taiwan.

Gibbert, M., Leibold, M. and Probst, G. (2002),"Five styles of Customer Knowledge Management, and how smart companies use them to create value", *European Management Journal,* Vol. 20, No. 5, pp. 459-469.

Henderson, R. M. and Clark, K. B. (1990), "Architectural innovation: the reconfiguration of existing product technologies and the failure of established firm", *Administrative Science Quartely,* Vol. 35, pp. 8-25.

Hyötyläinen, M. and Möller, K. (2007), "Service packaging: key to successful provisioning of ICT business solutions", *Journal of Services Marketing,* Vol. 21, No. 5, pp. 304-312.

Kerkhoff, C., van den Ende, J. and Bogenrieder, I. (2003),"Knowledge Management in the professional organisation: A model with application to CMG software testing", *Knowledge and Process Management,* Vol. 10, No. 2, pp. 77-84.

Kohli, A. K. and Jaworski, B. J. (1990), "Market orientation: The construct, research proportions, and managerial implications", *Journal of Marketing,* Vol. 54, No. 2, pp.1-18.

Mason, K. and Leek, S. (2007), "Learning to build a supply network: an exploration of dynamic business models," Lancaster University Management School, *Working Paper* 2007/036, pp. 34.

Mithas, S., Krishnan, M. S. and Fornell, C. (2005), "Why do Customer Relationship Management applications affect customer satisfaction?", *Journal of Marketing,* Vol. 69, No. 4, pp. 201-209.

Nätti, S., Halinen, A. and Hanttu, N. (2006), "Customer knowledge transfer and key account management in professional service organizations", *International Journal of Service Industry Management,* Vol. 17, No. 4, pp. 304-319.

Nätti, S and Still, J. (2007), "The influence of internal knowledge transfer on customer perceived value in professional service relationships", *The Service Industries Journal,* Vol. 27, No. 7, pp. 893-905.

Nätti, S and Ojasalo, J. (2008), "What Prevents Effective Utilisation of Customer Knowledge in Professional B-to-B Services? An Empirical Study", *The Service Industries Journal,* Vol. 28, No. 9 (November 2008), pp. 1199-1214.

Payne, A. F., Storbacka, K. and Frow, P. (2008), "Managing the co-creation of value," *Journal of the Academy of Marketing Science,* Vol. 36, pp. 83-96.

Pekkarinen, S. and Ulkuniemi, P. (2007), "Modularization of customer interface - a key for low cost strategy in services," *Proceedings of the XVII International RESER Conferenc*e, European Research Network on Services and Space, 13-15th September 2007, Tampere, Finland .

Pekkarinen, S. and Ulkuniemi, P. (2008), "Modularity in developing business services by platform approach", *International Journal of Logistics Management,* Vol. 19, No. 1, pp. 84-103.

Pekkarinen, S., Spring, M. and Ulkuniemi, P. (2009),"Adaptive triads for providing modular business services", paper presented at the *16th EurOMA conference,* 14-17 June 2009, Göteborg, Sweden.

Rollins, M., Pekkarinen, S. and Mehtälä, M. (2009), "Inter-firm customer knowledge sharing in logistics services: an empirical study," paper presented at *the Centre of Business & Industrial Marketing Annual Workshop* January 2009, Atlanta, Georgia, U.S.

Saarel, D. A. (1995), "TRIADS: Self-organizing structures that create value," *Planning Review,* Vol. 23, No. 4, pp. 20-25.

Sanchez, R. and Collins, R. P. (2001), "Competing- and learning – in modular markets", *Long Range Planning,* Vol. 34, pp. 645-667.

Schilling, M. A. and Steensma, H. K. (2001), "The use of modular organizational forms: An industry-level analysis. *Academy of Management Science,* Vol. 25, No. 2, pp. 312-334.

Spring, M. (2003), "Knowledge management in extended operations network", *Journal of Knowledge Management,* Vol. 7, No. 4, pp. 29-37.

Spring, M. and Araujo, L. (2009), "Modularity in complex services: strategic, organizational and spatial implications," Paper presented at the *16th EurOMA conference* 14-17, June, 2009, Göteborg, Sweden.

Ulkuniemi, P. and Pekkarinen, S. (2009), "Creating value in business service relationships through modular services," *Proceedings of the 18th IPSERA conference* 5-8 April, 2009, Oestrich-Winkel, Wiesbaden, Germany, pp. 691-707.

Vargo, S. L. and Lusch, R. F. (2004), "The Four Service Marketing Myths: Remnants of a Goods-Based, Manufacturing Model", *Journal of Service Research,* May 2004, Vol 6, No 4, pp. 324-335.

Vargo, S. L. and Lusch, R. F. (2008), "From goods to service(s): Divergences and convergences of logics", *Industrial Marketing Management,* Vol 37, pp. 254-259.

Voss, C. and Hsuan, J. (2009), "Service architecture and modularity," *Decision Science Journal,* Vol. 40, No. 4, forthcoming.

Yin, R. K. (2003), *Case Study Research, Design and Methods,* Sage, Newbury Park, CA.