Managing the Software Market Evolution – a Network Approach to Value Creation in Software Business

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Abstract

Traditionally software companies create solutions independently. The present orientation is changing towards more collaborative and open one also on software business branch. Maturity of the ICT market enables and also enforces the orientation from technology to content and/or services. Customer's role is changing rapidly, and technological infrastructures have opened global markets even for individual consumers. Emergence of different internet-based developer communities also reveals that the customer is not a passive buyer anymore, but can be an active network player. To succeed in this complex environment software companies should be able to create strategies that are synchronized with market evolution to support their capability to follow constantly changing markets.

In the present interconnected world of organisations, activities in the nets are worth exploring, not only the actors. This study focuses on discussing one key topic of present software business:

How software companies can develop more customer-centred business strategies via value nets in order to manage their value creation processes on constantly changing markets?

Proposals of how to analyse this important area will be made on the basis of literature and results from two software company case studies.

Keywords

software business, value nets, customer, market evolution

Introduction

If monitoring the actual situation on markets the current trends of outsourcing and globalization together with the spread of information technology are leading us to analyze the market phenomenon through "network glasses". Actors, activities and resources with the concepts of communication and abundance are the key elements to compete in this global economy. What benefits are these networks offering for a single company then? Researchers (Möller and Svahn 2003, Mc Loughlin and Horan 2000) point out the collective benefits, which allow network members to concentrate on their core activities and are supported by completing activities from other network members. Achrol and Kotler (1999) continue by stating that idiosyncratic investments in fixed assets and technology get lower with the

benefits of flexibility and ability to change over time. Gulati (1998) points out the social impact of networks. The other side of the coin has also been researched. Networks may have negative effects as well e.g. in forms of social, managerial, and equity issues. Håkansson and Snehota (2002) discuss about three network paradoxes 1) opportunities and limitations in networks, 2) influencing and being influenced in a network, and 3) controlling and being out of control in networks.

Roles of different actors and the various value creating activities within the software industry – including customers – are the main interest of this study. As there is a lack of suitable theories to explain software companies' capability to follow constantly changing software markets, to implement suitable strategies to answer to this market evolution, to recognize the customer's changing role and to be aware of the important value creating activities in different business networks, the following research question is discussed.

How software companies can develop more customer-centred business strategies via value nets in order to manage their value creation processes on constantly changing markets?

Evolution of information and communication technology has enabled globally open markets in 24 hour principle during the evolution of this so called "Network Era". The so called "New or Digital Economy" (Carlsson 2004, Eliasson et al. 2004) relies heavily on the Internet. To get a better understanding of the business network phenomenon, two middle-sized international software companies were studied during 2002–2004 to analyse their businesses, business network formation and future challenges. The results of these case studies and results are presented in this paper.

Research methods

This study has its methodological basis on qualitative research (Miles and Huberman 1984, Myers 1997). More precisely the study combines case study research (Orlikovski and Baroudi 1991, Alavi and Carlson 1992) and theory creating based on the analysed case data. First the theoretical ideas of software business strategies and value creation are analysed on the basis of existing literature and a framework for analysing networked software industry is created. The empirical material was gathered of two internationally operating software companies, which were selected according to Messerschmitt and Szyperski's (2003) framework for natural businesses partitioning of the value chain.

The first case company is situated in an application software supplier side, a system integrator and an infrastructure service provider position and the second one operates as an application software supplier but also as a system integrator and an industry consultant when reflecting the companies to Messerschmitt and Szyperski's (2003) framework. First we discuss about theoretical implications of implementing strategies that help in keeping up with software market evolution as well as how software companies involve themselves in different business networks in order to react to market movements and to offer value for customers.

Implementing strategies that help in keeping up with software market evolution

Strategies of any particular software business company should match with customer's value expectations and processes whether the customer is a company or an individual consumer. It is also obvious, that the role of a customer in general is changing. More value is demanded and a customer may also act in different roles in business networks. Customers – including individual consumers – are taking more active role in the context of software business. Cusumano (2004) has discussed strategies in software businesses perspective and raises seven basic questions to consider:

- Whether to be a products company or a services company?
- Does the company sell to individuals or enterprises, or to mass or niche markets?
- Is the product horizontal or vertical?
- Is it possible to generate a recurring revenue stream to survive in good times as well in bad?
- Is the target on mainstream customers, or is there a plan to avoid the chasm?
- Which role is the company willing to have: leader, follower or complementor?
- What kind of character is wanted for the company?

It is obvious that these questions should be emphasized considering software businesses strategic choices in different phases of companies' evolution. The actual purpose of this article is to stress the importance of business network strategy formation in order to answer research question and to consider the questions raised by Cusumano (2004). We want to highlight the customer's significance as most the literature emphasizes the selling company perspective and customer perspective is left without any notion. For example, Dell has succeeded in building the computer closer to the market and has forced its competitors to modify their business models towards similar type of mode and thus reduce the inventory carrying risk (Kothandaraman and Wilson 2001).

Common critical aspect for all types of strategic nets is their ability to create value. (Möller and Svahn 2003). Möller and Svahn (2003) have defined a value system continuum (Figure 1), which is based on three ideal value systems. In their model the left end illustrates stable and clearly specified systems. The middle of the model contains the relatively well-known value systems with local and incremental modifications. The right end is the most interesting one including the emerging value systems, where radical changes occur and new value activities with old and new actors are developed. The motivation for these emerging new value systems is innovation based and aims to commercialize new technologies, products or business concepts. Möller and Svahn (2003) mention mobile services as an example of the emerging value systems, which involves complex learning processes and requires several actors' (operators, software producers, content and service providers) to participate on the development, delivery and maintenance of these services.

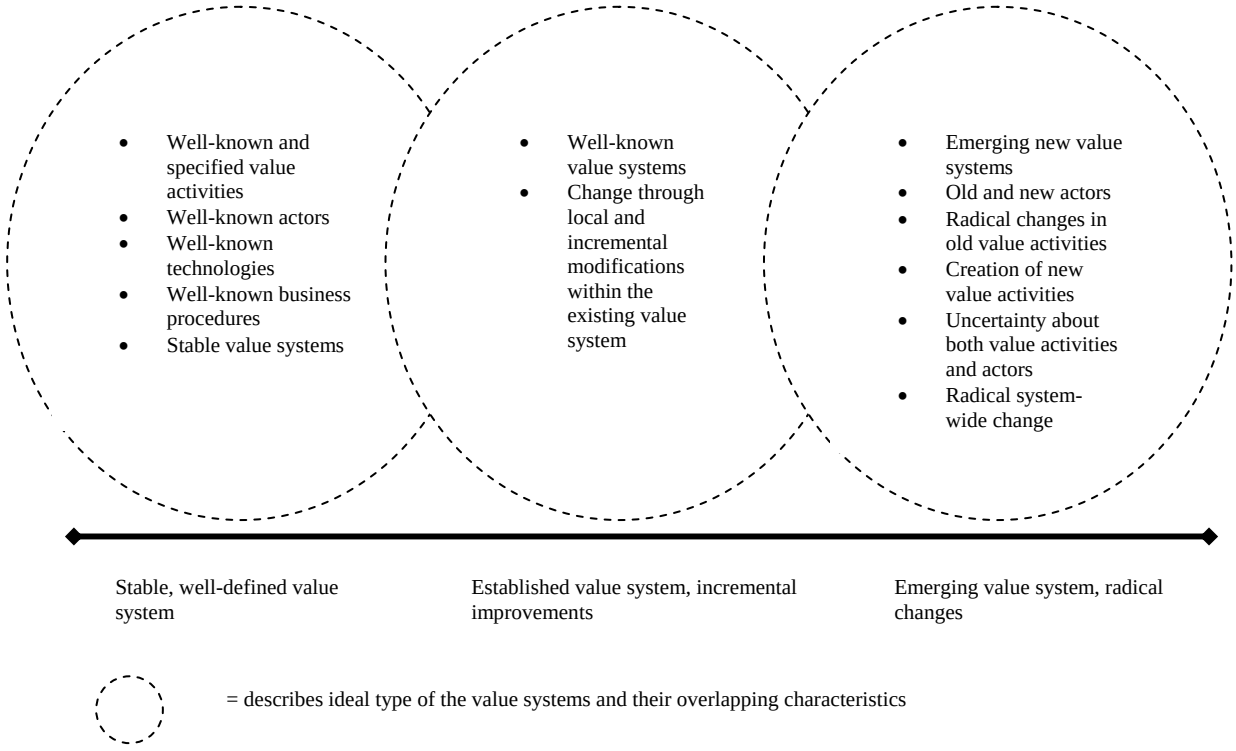

Figure 1. Value system continuum (Möller and Svahn 2003 p. 215)

To complete the ideas of Möller and Svahn (2003) we point out a possibility to create more open value systems in the sense of more open customer interfaces, which allow more interaction between value systems and their customers.

Introduction to case studies

During 2001–2004 two software product business companies – from now on referred as Company A and Company B – were studied to gain empiric material. No suitable analysis frameworks were available for carrying out the analysis needed for the two case studies and thus it was necessary to start with creating such a framework based on the existing theories. First module for the analysis framework came from general literature on software industry, software business models and networks. The focus in both cases studied was on telecommunication business, so the second module for the analysis framework was created by exploring the articles, literature and the Internet to learn more about the branch. The idea was to analyze first the company's inner operations targeted to produce, market, sell, generate revenue, service and implement the offerings for outer markets. Because the emphasis was on analyzing the companies' relation to other companies including competitors, (potential) customers, (potential) partners and other unrecognized actors, it was necessary to find some kind of a tool to analyze the network structure. Thus the third module came from Parolini (1999), who offers a value net analysis tool, which seemed best suited for analysing these cases. Value net analysis tool enables to make explicit the actual actors and activities within the network. It was also important not to forget the context – software business. Combining

the theories of software business models and value net, a framework for analyzing the cases was constructed. The analysis framework contains:

1) Theoretical background and evidence on software industry, software business models and business networks.
2) Background information about the telecommunication oriented software business.
3) Business models in software business context.
4) Value Net analysis tool adapted from Parolini (1999) for opening the network structure and activities.
5) Customer's position in relation to companies' business networks.

In the following sections the developed analysis framework is used in the corporate case studies.

Case study 1: Business nets for emerging mobile services

Company A develops platform software and applications for mobile services targeted to customers via third parties. The offering consists of tools to produce and manage value-added services, which have become popular on mobile devices especially among young people.

Overview of the empirical data

For this case study, three key persons in the case company were interviewed. They are responsible for the marketing, sales, and product development. The Internet was used as an information source for the case company as well. Some general data concerning mobile business was gathered from public reports and Internet. The empirical data gives an overview of the present situation and describes the structure of the network of organisations in which the case company is involved. The overview of the case company is shown in Table 1.

Table 1. Overview of Company A's business.

Business area	Activities
Products	End user applications and business management tools
Owner relationship	Owned by Finnish tele-operators
Customers	Mobile operators, service providers and portal owners
Revenue	License sales, product development financed by parent company
Marketing, sales and distribution	Mainly by retailers, also some direct activities and by original equipment manufacturers (OEM)
Partnerships	Partnership-network with international telecommunication companies and equipment- and network manufacturers
Internationalisation	Operation in global markets
Competitors	One strong domestic competitor, globally the most challenging competitors from the USA

Table 1 illustrates a quick overview of the case company and leads to its analysis in next section.

Value net for the first case company

Value net for the Company A can be structured from the existing information. We have built a strategic map to illustrate Company A's key value net nodes and flows. The map is based on Parolini's (1999) value net analysis tool. Company A co-operates with many other companies, too. All of them have different roles and positions in the network. From the customer's point of view individual companies are not visible. The customer sees only processes and a brand which combines these processes under the whole product which is accessible e.g. from the Internet. The value net of Company A is presented in Figure 3 to analyse the overall value creating system, the making/buying/connecting choices, the most/least profitable activities, system bottlenecks, the possibilities of reconstructing the role of final customers and the possibilities for innovations.

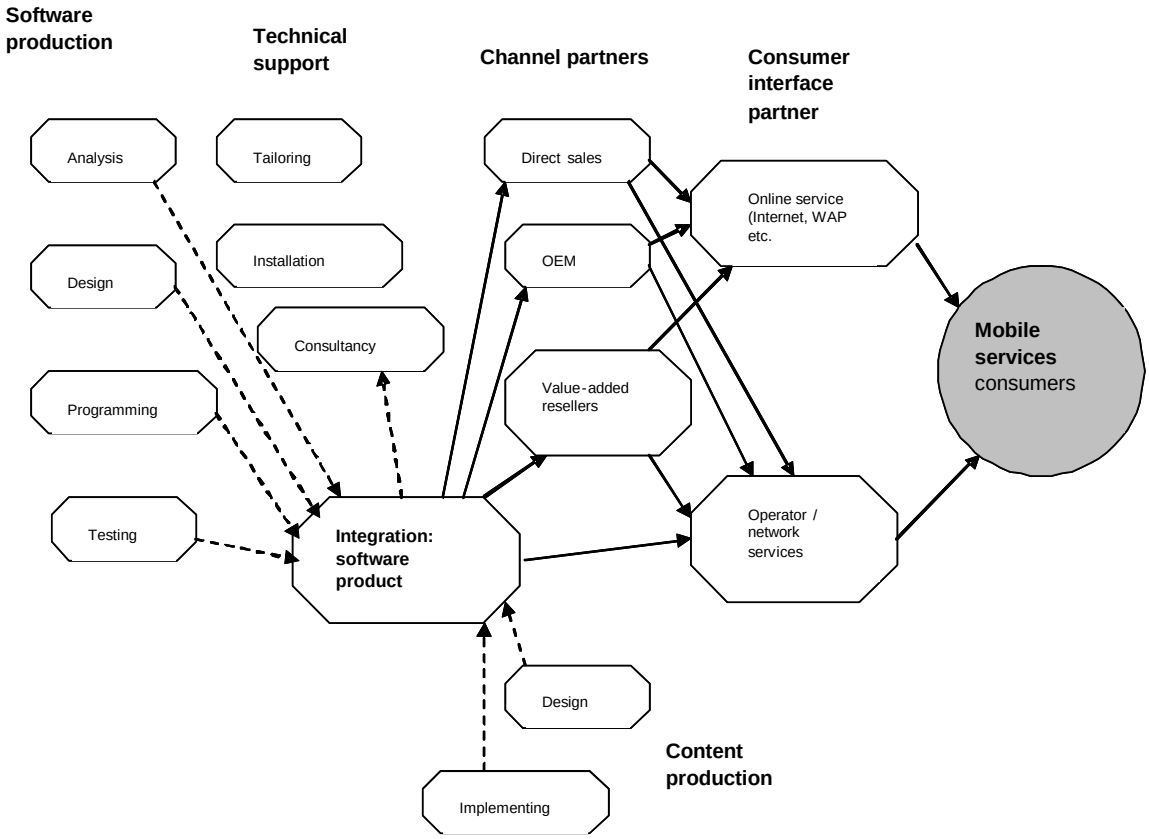

Figure 3. The key nodes and flows of the Company A value net.

The actual consumption is illustrated with grey circle. The activities performed by software production, technical support, channel partners, content production and consumer interface partner are illustrated by white octagons. The arrows describe the flows between activities, whilst the dashed ones have less relevance to the actual mobile service consuming. The software vendor is quite distant from the end-user. From the Company A's value net, it is possible to find the processes and activities important for the end-user. Software production and technical support form supporting activities and are not usually seen by the end-users. More visible parts of the processes for the end-users are the channels and consumer interface partners. Business development suggestions for Company A, based on the value net analysis, are presented in the next section.

Business development suggestions for Company A

A company's position in the network may vary depending on the offering. Company A acts as a software vendor by offering software products for a customer segment. It also acts as a system integrator by installing and testing the software products. And finally, it acts as a service provider by providing the after-sales service. The classification of product vendor, system integrator and service provider relies on the Messerschmitt and Szyperski's (2003) framework. Whether to be a product vendor, system integrator or service provider? The mobile communication services market segment provides growth and revenue opportunities for all three. Messaging software developers, device manufacturers, middleware developers, ASPs, systems integrators and Internet portals have all noticed the expected growth in the mobile messaging area.

Company A is heading towards mobile messaging application developing. However, development of new products requires investments and skilful employees. Thus focusing on more pure application development could save costs and allow the employees concentrate on the development of core product messaging applications as core products. For these new software products the appropriate partners in the fields of product development, marketing and sales and service and implementation should be assessed as well as significance of customers in the business processes.

Customers are willing and able to personalise the goods they are buying. They are also willing to become involved in the product development processes. They give feedback of the products they use and their suggestions for improvements should be taken seriously. Some of the customers are even willing to take personal responsibility for certain value activities such as testing. However, one company alone has fewer possibilities to satisfy the user needs than several networked companies with their special core business areas combined. Networked companies have better possibilities to offer a complete product with additional features to the customer. Customers may still join the pieces of the puzzle to personalise the product or service offered by certain networked business group. Our suggestion is to move the thinking towards more customer sensitive business logic.

More interaction between the case company and its customers - also in the business sense - could be attained by developing a **virtual market space and community** (e.g. Amazon) for customers and software developers and the various partners. Virtual community in this context means a special portal or mobile service, where the network of companies offers software and service purchased as self-service. This includes the possibility for the customer to influence on the products or services and is part of the value creation process. The possibility for direct feedback is offered. The community supports interaction between the network and its customers and could lead to the birth of a smaller user and developer communities, which would be important sources of information for the networked companies. Personalisation of the products or services is highly relevant. Part of the software could be offered freely on the Internet for example based on the loss leader or service enabler business models (Hecker 2000). The community may bring together a range of software products and related services under a mutual brand. One company in the network may act as a network-builder and orchestrator and integrate different products and services by using existing distribution channels – very often on the Internet. The leap towards a multi-dimensional network strategy has been taken according to Möller et al. (2001). For example, many Finnish software product or content companies are small on the international scale, and the move

towards e-commerce could offer them more revenue possibilities by combining products under a mutual brand. This would also bring them closer to the customer. The efforts in marketing, sales and customer services in one single company are also quite reduced when compared to the possibilities for several networked companies. One suggestion for moving towards a more customer-oriented business is presented in Figure 4. It shows how the traditional company – distribution – customer-approach could be turned around and the desired value could be produced by a certain value creating system via mobile or internet services.

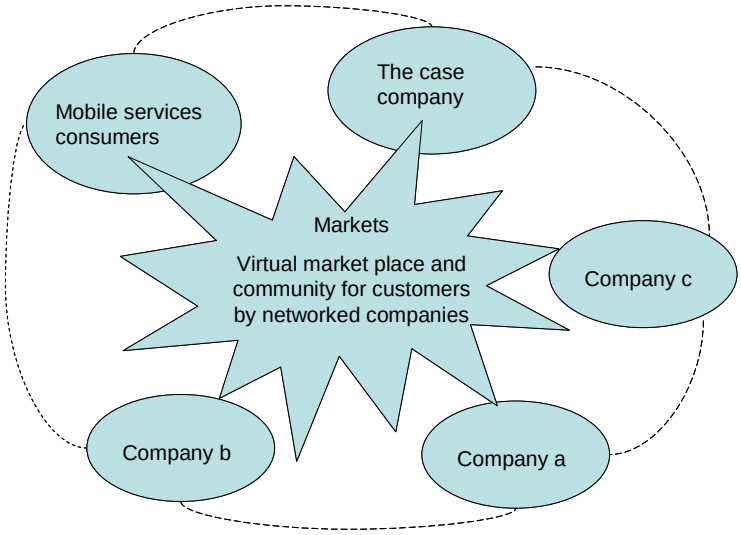

Figure 4. A virtual market space and community of customers through networked companies.

Figure 4 very simply illustrates the common interface for customers and networked companies producing mobile products and services. Case company A is operating as a network builder and an orchestrator. The simple model attempts to show how the different mobile services and products producers are able to interact with the customer and each other and combine their offering in a common virtual market place and community with a common brand.

Case study 2: Who is our customer? Analysis of software company's value creation strategies

A rapidly growing market niche for software applications is the planning and management of product related data during the product's development process and beyond – during the manufacturing, usage and service of the developed product. Since the starting point of product development and production is planning, some software companies have become interested in special software applications that facilitate product planning, conceptualisation and engineering. Unfortunately, these processes are quite fragmented and abstract, and in the case of high-tech products a large number of technologies are involved. Moreover, any software application that would support these processes must also be tied to some product development methods, modeling languages and tools used during the rest of the life cycle of the product. This broad and dispersed software application market is the context of this case analysis. The market is approached from the perspective of a small software company that has specialised in this market and analysed with the same framework presented in section Introduction to case studies. In particular, we are interested in what strategic value and how the software

company can produce for its customers – and who those customers are, in the first place. The short overview of company's business is presented in Table 2 before actual case analysis.

Table 2. The overview of Company B's business

Business area	Activities
Products	Software application integrates the customers' product development processes into an advanced marketing, product modeling, development and testing environment. It can thus be considered as a software-based product development suite offered as a full-fledged Commercial-Off-the-Shelf (COTS) software product.
Owner relationship	Owned by a Finnish internationally operating multi-branch software company.
Customers	Mobile phone manufacturers, contract manufacturers, educational institutes.
Revenue	License sales, product development financed partly by parent company.
Marketing, sales and distribution	Mainly by direct sales.
Partnerships	Emerging partnership-network with international mobile phone manufacturers and educational institutes.
Internationalisation	Operation in global markets.
Competitors	One strong international competitor, globally the most challenging competitor from Israel.

The data gathered from the Company B enables us to make explicit and analyse the company's value net and study its effectiveness. The markets of Company B were first divided into a few segments, including mobile phone producers, subcontractors of the mobile phone producers and other suppliers, other electronic device developers and manufacturers, and the training sector. The most interesting segment of these was the one consisting of mobile phone producers.

Company B's initial idea was to introduce a set of related tools that would control the whole product development life cycle from the initial concept design to the service and maintenance phase, based on digital product design data created during the early R&D phase. This data would be used e.g. in the product launch phase by the marketers and during the service phase by the maintenance personnel. The development tool set – a software application - focuses on mass market high-tech products, and especially on mobile phones. The consumer electronics industry in more general terms is, however, seen as the most important market for the tool set.

Value net for Company B

According to the value net thinking it is useful to make explicit the value net functions and find innovative ways to enhance the net. The data that was gathered from Company B makes it possible to draw the value net shown in Figure 5. First we'll discuss about Company B's value activities. The value net indicates that the value creating activities of the Company B are still quite sparse and the number of actors making that net to function is not that big. The programming, technical support and sales activities are in its entirety under the control of the

case company. One distributor is helping the company in the process of making the tool set ready for international markets.

As the company is still in its early stages of development and has only a few customers, the essential questions, in addition to the effectiveness of the value creating activities, are which customer segment(s) the company should target and who would be the focal customers. Answers to these questions depend also on which kind of customer interface the company should establish and how it would be managed.

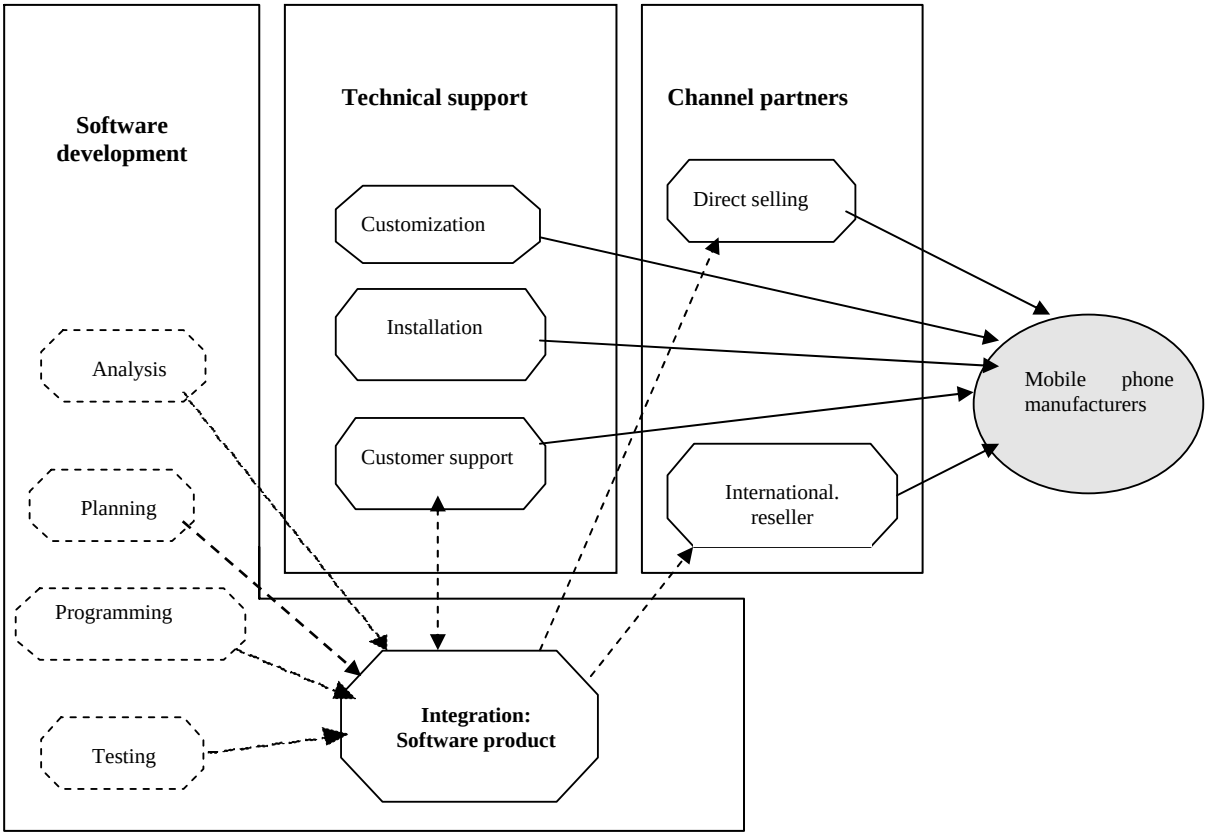

Figure 5. The Company B's value net.

The grey ellipse identifies the actual customers – mobile phone manufacturers. The activities are illustrated with white octagons whilst the ones with dashed lines are not so important for the customers. The activity flows are illustrated with arrows. Parts of the flows are important from customer's point of view and the dashed lines illustrate the supporting ones. In the business analysis framework suggested by Hamel (2000), the customer interface involves how the company finds its customers, which channels it uses to serve the customers, what kind of customer support and services it delivers, what information it collects about the customers and how it uses the information in favour of the customers, how the relationships between the company and the customers work, and lastly, what different pricing mechanisms the company has. The value net part of the framework covers the network that complements and expands the company's own resources. The elements of the network include also subcontractors, partners and joint ventures. Furthermore, Hamel (2000) describes how the planning and management of the value net can be an important source of innovative business concepts. As

the Company B's value network formation is still in its early stage, analysis of what kinds of partners are needed to complement the company's own resources and know-how, in order to secure overall customer satisfaction but still focus on the most important value creation activities, is especially needed.

Market strategies used by the mobile phone manufacturers

Company B was interested in the seven biggest mobile phone manufacturers and their ways of action, from the perspective of the tool set offered by Company B. These potential customers were first analyzed using the following essential aspects: key figures and the main business sectors, business strategy, R&D, business networks, and different cooperation modes, especially collaboration with contract product manufacturers. Most of the mobile phone manufacturers are large and diversified companies that include also other business sectors besides mobile phones. Some companies do not have their focus in mobile phones, but e.g. in consumer electronics in more general terms. The business cultures of the companies vary notably, depending on their geographical locations. However, it was possible to find clear similarities in the business strategies of certain mobile phone manufacturers. Based on this, the following market based product development and management strategies (see also Figure 8) could be identified:

- Closed market strategy,
- Semi-open or network market strategy, and
- Open market strategy.

In the closed market strategy, the focal company is responsible for all the necessary business operations and all the product life-cycle phases, i.e. the company manages all the processes and activities of the life cycle of the product. When the company moves into the semi-open market strategy, it outsources some parts of its business to subcontractors that manage these outsourced parts. Using the OEM-concept, a mobile phone manufacturer has to decide which activities in product design, manufacturing and maintenance it will outsource, which technology suppliers it will rely on and how intensively it will manage the supply chain. With regard to the latter, one of the most important decisions is if the product-specific supply chain would be based on competition or partnership. This again affects significantly on the strategies of the potential suppliers, e.g. how they adapt to the customer's processes, product development tools and organization.

None of the analysed potential customers used the open market strategy. However, some companies were on a track to this direction. In those cases, the mobile phone manufacturers outsourced extensively their activities into the hands of subcontractors and their subcontractors, involving e.g. R&D, manufacturing or services. The companies thus focus on brand management, where they own and maintain rights in a specific brand name, but the design, development, manufacturing etc. may have been transferred to other actors outside the company.

Relationship management between the OEM brand owner and its suppliers changes dramatically in this situation, because the suppliers are directly responsible to the OEM customer for the implementation of the whole product. The management, control of R&D and manufacturing are transferred to the suppliers and their subcontractors. The brand owner is interested only in turnkey branded product supply, and its main task is to manage and monitor

the successful materialization of the result of the process. For example, Moore (1995) has pointed out that the driving force behind leading high-tech products is the brand name.

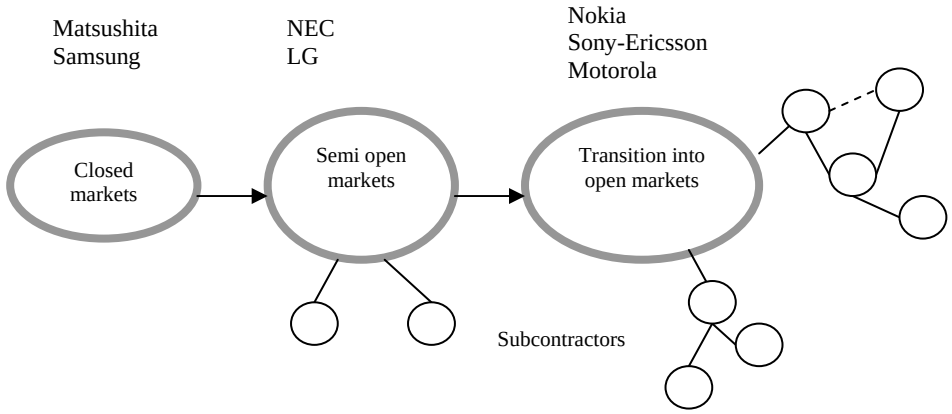

Figure 7. Staged transition from closed environment into open markets.

Based on the analysis of the gathered data, most successful companies were those mobile phone manufacturers that had moved partially or are in the middle of the process to move totally to the open market strategy. New actors in the mobile phone field will find good opportunities especially when moving from fully closed markets to fully open markets. The biggest OEM firms following the semi-open market strategy still behave much as in the case of the closed market. According to the data Matsushita (Panasonic Mobile Communications Co. Ltd) and Samsung follow mainly the closed market strategy, i.e. produce most parts of their products by themselves. However, they have started to make use of the semi-open market strategy, by relying on subcontractors, system integrators, and technology platform providers.

Further, NEC and LG operate on the basis of the semi-open market strategy. They have outsourced at least parts of their product manufacturing, e.g. NEC mentions Celestica as one of its contract manufacturers (CM). Nokia, Sony-Ericsson and Motorola are in transition into the open market strategy, e.g. Motorola mentions that it operates with over twenty CMs. Nokia again offers its proprietary software platforms to other companies. Many of the main mobile phone manufacturers are in the stage of clustering their CMs, also according to their R&D abilities. The above-mentioned company, Celestica, has the capability to follow through the whole supply chain. At the same time the company is responsible for the functionality and efficiency of its subcontractor network.

Based on the classification of the mobile phone manufacturers we can contemplate where the Company B's primary customers in fact are located. In the case of the closed market strategy, the customer is the mobile phone manufacturer. The problem is how to find the right entry point into the company, i.e. to whom to sell the complex software tool that covers the whole life cycle of the product. When moving towards mobile phone manufacturers that follow the semi-open or open market strategies, the situation changes significantly. In these cases, the actual customer can be found either from the brand owner OEM company or from the network serving the brand owner. The problem again is to who to sell the software and

especially how to argue for the value of the product in the network (or in its R&D and manufacturing cluster), i.e. the benefits of a software application that covers the whole life cycle of the product, when parts of the life cycle have been allocated to different network parties.

Value net innovation – customer perspective

On the basis of mobile phone business network analysis it is possible to suggest value net innovation, which is illustrated in Figure 8.

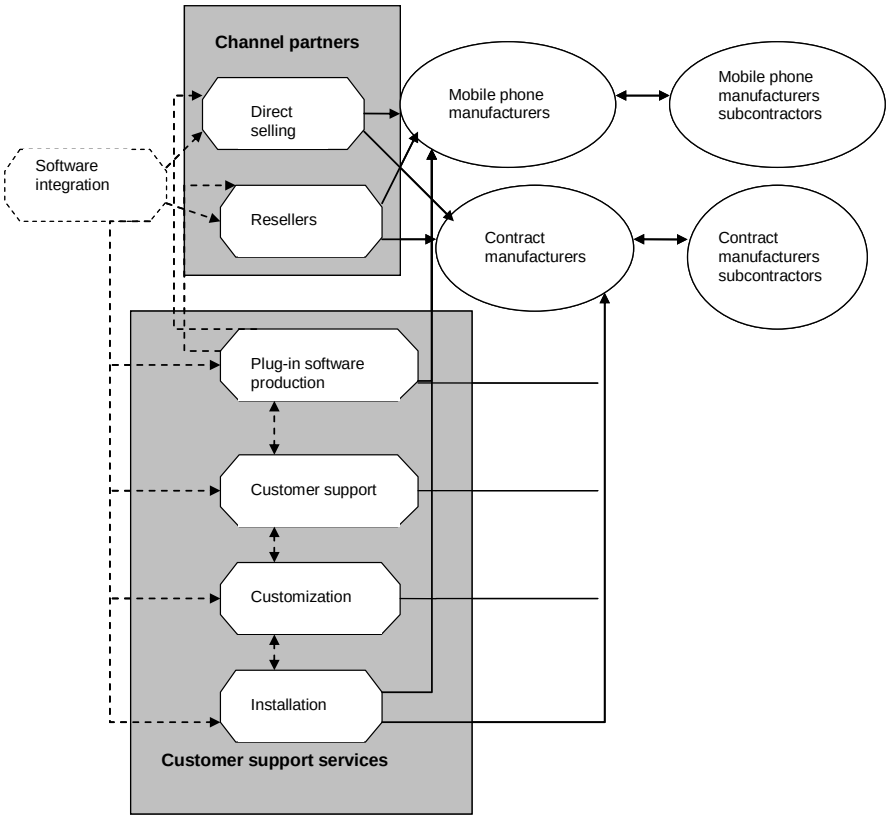

Figure 8. Value net innovation for case company's customer interface.

The white ellipses in Figure 8 illustrate the actual customer basis enlargened from single segment to four ones. The activities performed by customer support services and channel partners are illustrated in white octagons and are most relevant for customer whilst the software integration has less relevance. The actual activity flows from customer support services and channel partners are important and the flows from software integration to other activities are in supporting role. Figure 8 suggests that customer support services could be re-organised with new partners, who could be responsible of software installation, customisation, customer support, training and additional plug-in software production for Company B's customers needs. The selection of possible customer segments has also been enlarged and involves now mobile phone manufacturers and contract manufacturers with their subcontractors.

Conclusions

In the two cases we analysed the Company A's product was in the end of its life cycle and new successful solutions weren't developed yet. In the Company B case the product was just in its early phase of the life cycle. Common for both cases is uncertainty about market situation of the company and operation in various roles (cf. Messerschmitt and Szyperski (2003) framework). In Company A's case the network structure was stabled in certain mode, but was not leading to considerably successful business or innovations. In Company B's case the network formation was just in its early phase and many strategically important business considerations had to be made. If situating the Company A and B on Möller and Svahn's (2003) value system continuum (Figure 9) the both cases show that the question for customer value creation should be considered carefully.

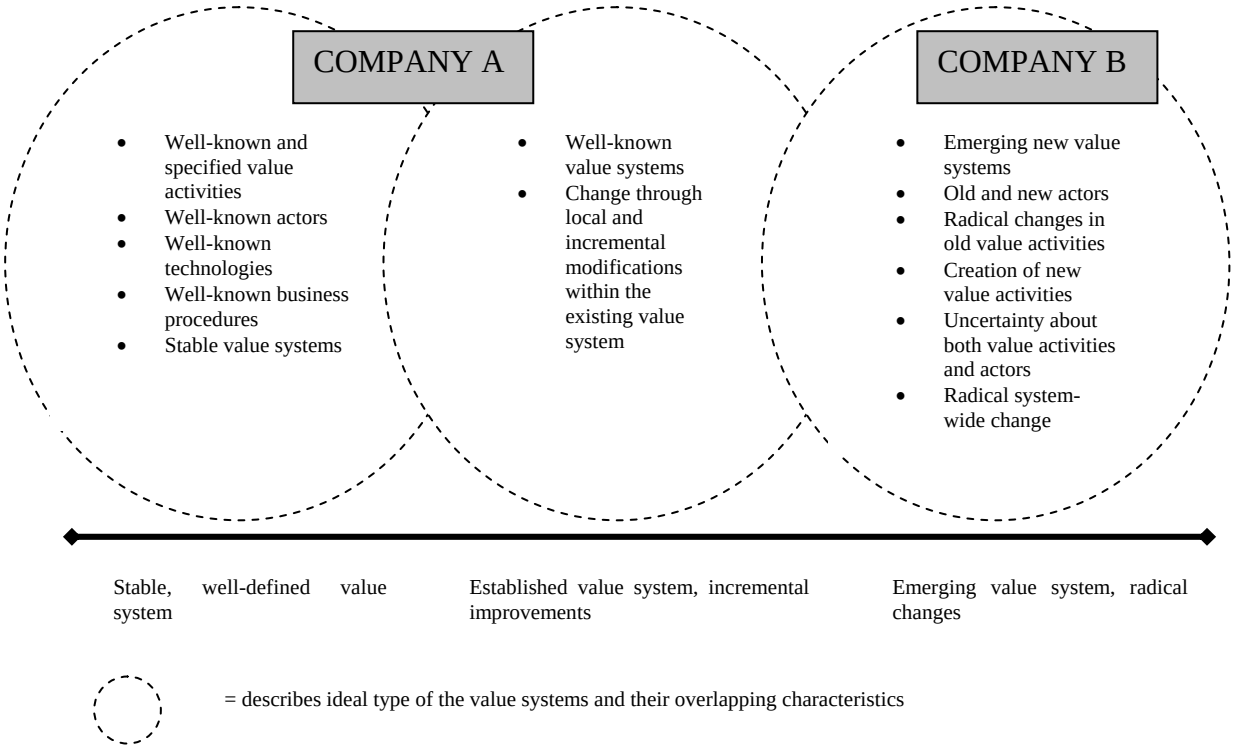

Figure 9. Company A and B on value system continuum (Möller and Svahn 2003).

Company A is very far from its actual customers and in the case of Company B seeks for customers were in acute phase. The studied two cases are a good starting point for deeper studies in the most interesting field of turbulent software business with its business network phenomena. The ability to react on market movements and customer needs should lead to consider network strategy formation in the very early phase of company's life cycle. The analysis framework used in studying Company A and B is suitable for analyzing actors and value activities involved in certain business networks. The framework has its limitations and the further studies are concentrating to enlarge the understanding of different market powers to understand and predict the software market evolution.

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