

Business Models and Networks: Assets and Capabilities in Software Businesses

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Competitive paper

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Abstract

In this study, we focus on the assets and capabilities of software companies from the perspectives of business models and value-creating networks. Prior to analyzing the key assets and capabilities in connection with diverse business models, we review the literature of related topics, including interorganizational exchange, strategic networks and capabilities. Then we present a classification scheme for distinguishing between different types of software business models. We classify software business models with two dimensions: the level of involvement in customer relationships and the level of homogeneity of offerings for multiple customers. In the empirical part of our research, we explore the key assets and capabilities, i.e. resources, in four different business model types. Finally, on the basis of our data, we identify acquisition and development of these resources either internally or externally through networks. Our aim is to study assets and capabilities in association with business models of software companies in order to understand the development of resources in specific business contexts.

Introduction

In recent years, software companies have been faced by the globalization of competition, increased pace of innovations, and fragmented customer needs. To respond to these challenges companies have focused on their core competences, which, in turn, have called for more network-intensive business behavior. As a result of specialization, companies need to acquire knowledge outside their own expertise to create and deliver value propositions to their customers. This development has led to increased efforts to develop essential resources through networks, especially in highly knowledge-intensive industries such as software business. The establishment and management of value-creating networks and strategic navigation in the network environment form a major challenge to software providers.

Assets and capabilities have received increased attention in the recent research literature (Teece et al. 1997, Rosenbröijer 1998, Tuominen 2002, Möller and Törrönen 2003). This study draws on the industrial network theory (Håkansson 1982, Powell 1990, Gulati 1998, Achrol and Kotler 1999, Möller and Halinen 1999), business strategy literature (Grant 1995, Mazzucato 2002), transaction cost economics (Williamson 1975, 1985), and resource-based view on assets and capabilities (Rosenbröijer 1998, Hooley et al. 1998, Möller and Svahn 2003). Two different

approaches are selected as theoretical lenses to conduct the study: (1) the business model perspective grounded on business strategy literature, transaction cost economics and the resource-based view is used to better understand what kind of assets and capabilities firms attempt to create in different business contexts, and (2) the network approach based on the industrial interaction and network theories, and the resource-based view is selected to analyze the development and acquisition of assets and capabilities both internally and through the relationships in business networks.

Despite of feasible analysis of resources in the network context (e.g. Möller and Törrönen 2003), assets and capabilities have not received sufficient attention in the literature in regard to different business models. Due to the wide variety of ways to conduct business in the software industry, we have classified software business models into four categories on the basis of prior literature. We see that relationships and collaboration in business networks vary in different businesses (Wilkinson and Young 1994, Ford et al. 1998, 70-72, Cannon and Perreault 1999). Furthermore, Håkansson and Snehota (1995, 180-181) point out that different types of businesses embody different approaches to develop assets and capabilities. Hence, our objective is to study the development of resources, i.e. assets and capabilities, within value-creating networks to execute various types of software business models. The contributions of this research are to: (1) explore, *what kinds of assets and capabilities are essential to different business models in the software industry* and (2) identify *how the key assets and capabilities are developed and acquired either internally or externally in different types of business models*.

This study is structured into six sections. After this introduction, in the second section we review relevant theoretical approaches in the prior literature to explain diverse forms of interorganizational exchange. In the third section, we discuss the concepts of assets and capabilities and business models, and develop a classification scheme to distinguish between different software business models. In the fourth section we describe the methodology of the study. In the final sections we present the empirical findings and discuss the conclusions.

Theoretical perspectives

For theoretical foundations on analyzing essential assets and capabilities in connection with different business models, we review prior literature on interorganizational exchange and different forms of relationships. The reviewed theoretical approaches

include transaction cost theory, interorganizational resource dependence theory, resource-based view on firms, and industrial network and interaction approaches.

The transaction cost approach

The transaction cost economics (TCE) first presented by Coase (1937) and further developed Williamson (1985) provides us with some attributes for the exploration of market versus hierarchical mechanisms for analyzing strategic dependencies. However, it has received some criticism due to that it deals with polar forms of buyer-seller relationships –markets and hierarchies– and due to its inability to adequately explore e.g. all available governance structures, repeated transactions and the dynamic evolution of governance and transactions (Ring and Van de Ven 1992). The transaction cost approach identifies three different attributes of exchange that are pertinent to different governance structures: (1) the *frequency* with which transactions occur focuses on the type and degree of interorganizational exchange. Also, Dwyer and Oh (1988) explain that transactional exchange typically involves single short-term events, which have a distinct beginning and end, (2) the *uncertainty* to which transactions are subject to and (3) the *assets specificity* involved in supplying products and services. The first two mentioned attributes provide us with support to identify and describe the various business relationships used to classify different types of business models, and the third attribute addresses the resources essential to different businesses. From the perspectives of our study, the limitation of the transaction cost approach is its strict focus on the transaction and the view of the extremes between markets and hierarchies. In addition, this approach focuses on the assets of actors but does not consider actors' capabilities in relationships, which are essential in our study.

The resource-related approaches

The interorganizational resource dependence theory takes a step further from the transaction cost approach by explaining the external perspective on how resources are developed and acquired by a firm. As Pfeffer and Salancik (1978) point out, the resource dependence perspective is based on the uncertainty created by the environment regarding the future of the firm and the role of resources in controlling the uncertainty. This view focuses on the interorganizational activities of actors where resources are exchanged or shared. Correspondingly, the resource-based view focuses on the internal perspective in the maximization of output from resources (Prahalad and Hamel 1990). The resource-based view originates from the work of Penrose (1959) and

is further developed by Wernerfelt (1984). These resource-related approaches provide us with basis to identify key assets and capabilities in different types of business models. They deepen our understanding especially on how resources are applied and combined by a firm and concerns the inimitable assets as basis for creation of sustainable capabilities (Hart 1995, Gabrielsson 2004, 94-99). According to Penrose (1959), the bundles of resources that are activated in different ways lead to incoherent performance and heterogeneous outputs in different organizational settings. Furthermore, Ariño and de la Torre (1998) point out that the increasing complexity of markets makes it difficult for firms to have all the necessary resources in their possession to compete effectively.

The industrial network and interaction approaches

Both the industrial network and interaction approaches emphasize relationships as dynamic processes of exchange between actors in an industrial market. The study on exchange and development process of heterogeneous resources is a central concern in these approaches (Håkansson ed., 1982). The interaction theory focuses on focal actor's direct relationships. On the contrary, the industrial network approach extends the focus on indirect relationships. Analysis of both of these relationships makes it possible to gain a more comprehensive view of networks, and provides us with basis to analyze value creation among multiple actors. In the recent literature, value-creating networks are defined as a set of relationships between firms, where companies engage in multiple two-way relationships to bring increasingly complex products and services to the market (e.g. Aldrich, 1998; Parolini, 1999; Bovet and Martha, 2000).

To understand industrial networks and the means value is created within them, we need to consider the fundamentals of relationships. Håkansson and Johansson (1992) have identified the underlying fundamental elements of networks as actors, resources and activities. According to them, actors perform and control activities that are based on control over resources, and develop relationships with each other through exchange processes. Activities occur when actors combine, develop, exchange, or create resources by utilizing other resources in the network. Ford (1998) points out that resources of one company are likely to become oriented toward a specific use and will be tied to the resources of other companies. Essential resources can be in many cases physical and tangible assets, but more commonly companies are tied to each other through intangible knowledge resources (Ford et al. 2002). As Ford et al. (1998) emphasize that interdependence between companies through resources and activities

influence business strategy, we assume that it also affects business models as the manifestation of strategy. The industrial network and interaction approaches provide us basis to identify the actors and activities related to the acquisition and development of resources.

Conceptual Development

We draw on the recent literature to analyze the key assets and capabilities in software companies. To identify these resources in connection with particular types of business of software companies, we discuss the concept of the business model and establish a classification scheme to distinguish between different types of software businesses.

Perspectives on assets and capabilities

The assets and capabilities of actors are among the central issues in understanding and analyzing companies in networks. This accentuates the essence of resources in core competences (Selznick 1957, Prahalad and Hamel 1990), as resources are generally seen as firm-specific property being subordinate to core competences. However, literature of resources is somewhat diversified to the degree of terminology used. Some authors divide firm-specific resources into assets and capabilities (e.g. Barney 1991, Durand 1997, Hooley et al. 1998), whereas others (e.g. Rosenbröijer 1998, Gabrielsson 2004) distinct between resources and capabilities. In this study, we identify the resources of a firm as assets and capabilities. This is compliant with the view of Metcalfe and James (2000), who define tangible and intangible assets as physical and nonphysical resources, and capabilities as intangible knowledge resources. The essential issue in regard to core competences is nonetheless the inimitability of the resources. In addition to being an important intangible asset for a company, a firm's network offers an access to assets and capabilities of other network actors (Foss 1999, Gulati et. al 2000, Chetty and Wilson 2003, Möller & Törrönen 2003, Möller & Svahn 2003). As some of the resources in business networks remain inimitable, it is interesting to identify essential resources in diverse business models and analyze how they are developed and acquired.

Möller and Svahn (2003) point out, that complexity of value proposition correlates with the number of capabilities and scope of networks required to execute successful implementation in the markets. Håkansson and Snehota (1995) stress the critical function of activity links, actor bonds, and resource ties in connection to both capability development and strategy development. The capabilities of a company reflect the

success in combining resources to perform activities through internal and external relationships (Håkansson and Snehota 1995, Rosenbröijer 1998). In addition, the required technical and managerial skills have an effect on interaction in relationships (Ritter 1999, Möller and Törrönen 2003). The concept of capabilities is later extended in the literature with the dynamic capabilities view (e.g. Teece et al. 1997; Möller and Svahn 2002, Holmen et al. 2002), which attempts to distinct the know-how role from know-that role of the capabilities.

The development of capabilities in the industrial network perspective is not limited to a firm's relationships and resources, but is linked to the firm's strategy (Håkansson and Snehota 1995, Gadde and Håkansson 2001, Holmen et al 2002). This view proposes that capabilities vary according to business strategy and value systems configuration. Furthermore, Möller and Törrönen (2003) and Möller et al. (2004) suggest that it is useful to describe value production through a continuum expressing the level of complexity involved and the time horizon of value realization, and that the emphasis of capabilities vary in different value systems. Möller et al. (2004) make a distinction between more general business capabilities and capabilities required to orchestrate strategic relationships and networks. This seems to be a useful approach to explore capabilities in complex value systems, which are bound to time and evolution of networks. Also Foss (1999) and Metcalfe and James (2000) identify that resources in businesses vary according to differences in the configuration of value-creating networks embodied in diverse businesses. We assume that in addition to analyzing capabilities in connection with the value system continuum, it is worthwhile to analyze both assets and capabilities in connection with different business models. In this study, we offer a complementary approach to the existing research by analyzing resources, i.e. assets and capabilities, in particular types of software business models.

The business model concept

The concept of the business model in the business and information systems literature refers to the ways of creating value for customers and to the way a business turns opportunities in the market into profit through sets of actors, activities and collaboration. Research on business models rests in many respects on strategy discussion and draws on strategic concepts and issues. Despite the confusion in the terminology related to strategy and business models, prior research has achieved a consensus on business models as a conceptual and theoretical layer between business strategy and business processes (Osterwalder 2004, Morris et al. 2004, Tikkanen et al.

2004). The construct of a business model includes some elements of business strategy and aims at describing the architecture of business as a manifestation derived from strategy (Osterwalder and Pigneur 2002, Rajala et al. 2003, Morris et al. 2004). Also, the business model has been defined as an abstraction of business (Seddon and Lewis 2003), which characterizes revenue sources and specifies where the company is positioned in its value-creating network in a specific business.

The essential elements of different business models are defined in different words by several researchers (e.g. Osterwalder and Pigneur 2002, Bouwman 2003; Rajala et al. 2003; Hedman and Kalling 2003; Morris et al. 2004 and Osterwalder 2004). Many of the studies identify a number of elements characteristic of different business models. To sum up the discussion, we have identified three elements in all of the studies reviewed. These elements, expressed in different words, are: (1) value propositions or offerings, (2) various assets and capabilities as resources needed to develop and implement a business model, (3) the revenue logic (including sources of revenue, price quotation principles and cost structures) which is characteristic of a particular business. In addition to these elements, some of the studies (e.g., in Timmers 2003, Osterwalder 2004, Morris et al. 2004) emphasize relationships with other actors as a crucial part of a business model. Timmers (2003) points out that, in the context of business models, the focus shifts from creating value through internal activities to creating value through external relations, and the amount of relationships multiplies. We identify these relationships as part of the value-creating network (including the network structure, the purposes or intentions of the network and the actor's roles and relationships) of a business model.

A classification scheme to classify software business models

For the purposes of this study, we classify the business models of software companies into homogeneous categories in order to analyze the essential assets and capabilities in different businesses. We establish a preliminary classification scheme to structure the analysis of our empirical data.

The analytical diversity of transaction cost approach (TCE) is clearly advantageous for our classification purposes. As reviewed earlier along with the theoretical perspectives of this study, TCE investigates a broad range of exchange-related issues including vertical integration and interorganizational relationships (Rindfleisch and Heide 1997). On the other hand, industrial network and relationship theory (e.g. Ford et al 1998) provides us with dimension to distinguish between different types of businesses

according to buyer-seller relationships. In regard to the defining strategic choice for the company in order to differentiate in business markets, Ford et al (1998) propose that three essential issues have to be considered. These aspects are 1) the company's market scope or customer portfolios, 2) the benefits that it provides to each, and 3) how the company organizes itself to achieve effectiveness and efficiency, which in turn affects its ability to deliver these benefits at acceptable costs. Hence, we need a dimension into our classification scheme reflecting interorganizational relationships in terms of the level of involvement in customer relationships. Ford et al. (2003) consider buyer-supplier relationships in terms of involvement, where low-involvement relationships are handled with limited co-ordination, adaptation and interaction. Instead, high-involvement approach includes more coordination and adaptation, which create interdependency.

In addition to attributes such as uncertainty and risks that affect the type of relationships in the value-creating network of a business model, the TCE approach considers the frequency of transactions and the similarity of the object of the transaction, i.e. offering. Thus, we aim at distinguishing businesses according to the homogeneity of offerings for multiple customers. Hayes and Wheelwright (1979) have studied the match of product and process structures in connection with transaction circumstances. They identify the following occasions (1) low volume – low standardization products implemented as one of a kind (2) multiple products – low volume (3) a few major products with higher volume and (4) high volume – high standardization commodity products. Apte and Vepsäläinen (1993) have adapted the principles of TCE to the integration of product strategy and distribution strategy to establish a continuum for distinguishing between products for two-dimensional analysis of the compatibility of products and distribution channels. The continuum of Apte and Vepsäläinen (1993) classifies products into complex, modular and standardized products. These studies support the selection of homogeneity of offering as a dimension in our classification scheme to distinguish between different types of businesses.

On the basis of the reasoning presented above, we establish two dimensions to classify software business models. These dimensions are operationalized as the level of involvement in customer relationships and the level of homogeneity (i.e. standardization) of an offering for multiple customers. This classification produces four generic types of software business models as described in Figure 1.

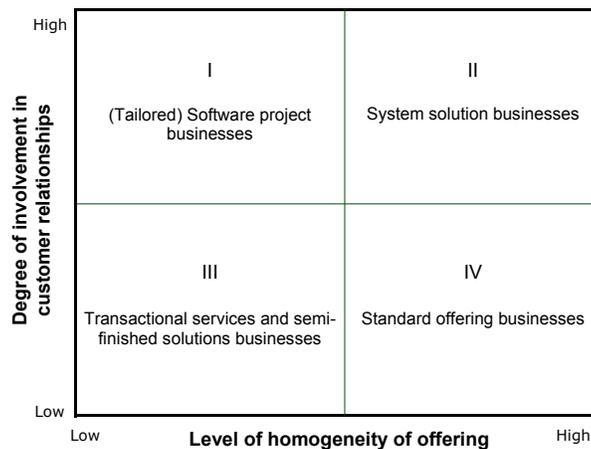


Figure 1 A classification scheme for identifying different types of business models

Type I of software business models is described as “Software project businesses”. A high degree of involvement in customer relationships and a low level of homogeneity of offerings characterize the businesses in this category. Typical offerings in this category are designed to meet customer-specific needs. Customer relationships in these businesses are based on close collaboration between software vendor and customers, and typical value realization includes a high proportion of direct consultation between the vendor and customer(s). The core competences within the business models of this type emphasize the ability to understand and solve customer-specific needs. Examples of businesses in this category include tailored software providers and IT consulting firms.

Type II of software business models incorporates “System solution businesses” with a high degree of involvement in customer relationships and a high level of homogeneity of offerings. The total offerings in these businesses are typically based on a uniform core solution, but are modified for customers by adding modular components and solutions. In these business models, the modification is sometimes carried out by value adding resellers (VAR) that act as software integrators of the system solutions. Ability to understand and solve customers’ needs in narrow segments is a distinctive core competence in business models of this kind. An example of businesses in this category is ERP providers such as SAP.

Type III of business models includes “Transactional services and semi-finished solutions businesses” characterized by a fairly low degree of involvement in customer relationships and a low level of homogeneity of offerings. Businesses in this category usually aim at serving the needs of several customers. This forms a major challenge for business performance, as the product or service offering is typically semi-finished and

based on a set of components, middleware or product platform. These offerings do not add value to customers as such, but are used as parts of more comprehensive value propositions. Due to the nature of offerings in this category, businesses increasingly aim at reusability of components. The core competences in the business models within this category are related to the ability to understand and solve technology-specific needs. Examples of businesses in this category include e.g. new media companies and game component providers.

Type IV in our classification of business models embodies “Standard offering businesses” that seek large numbers of customers and economies of scale through a high level of homogeneity of offerings. A common characteristic of businesses in this category is that the offering is comprised of uniform core product, modular product family or standardized on-line service. Also, businesses in this category typically exhibit a low degree of involvement in single customer relationships. The business models in this category comprise various models of direct and indirect mass-distribution, e.g. online distribution and diverse distribution partner networks. The core competences within businesses in this category are typically related to the ability to serve the common benefits of multiple customers. Examples of this category include commercial off-the-shelf software (COTS) and software as a service (SaaS) providers.

Table 1 Key characteristics of the diverse business model types

Business Model Type	I “(Tailored) Software project business”	II “System solution business”	III “Transactional services and semi-finished solutions business”	IV “Standard offering business”
Nature of offering	Typical offering is based on tailored, customer specific solutions	Typical offerings embody customized solutions, based on uniform core of several solutions or separate modules	Offering is based on set of components, middleware or product platform	Homogeneous offerings based on uniform core product, modular product family or standardized online service
Customer relationship construct	Customer relationship embody one-off production in close collaboration between vendor and customers, including direct consultation	Customer relationship through value adding resellers	Customer relationship through internal hierarchy	Customer relationship through wide distribution network including online distribution
Core competence	Ability to understand and solve customer-specific needs	Ability to understand and solve customers’ needs on narrow segments	Ability to understand and solve technology-specific needs	Ability to serve common benefits of multiple customers

Table 1 above summarizes the key characteristics of identified business model types when classified according to the dimensions of degree of involvement in customer relationships and the level of homogeneity of offering for multiple customers. The core competencies in the Table 1 are described as the essential ability of a business to add value to its customers. Core competencies of the company are in some other studies (e.g. Prahalad and Hamel 1990) identified mainly as activities of the value chain model. Our classification scheme is used to identify and analyze the key assets and capabilities related to the particular types of business models of software companies.

Methodology

In this study we analyze key resources of software companies using the business model concept as means to structure the research. We use a qualitative research approach which is carried out using the multiple case study methodology (Yin, 1994) for comprising structured interviews and observations to collect primary data. In addition to our intensive field study, we collected an extensive set of secondary data including internal documents, brochures, bulletins and annual reports, presentation material, reviews, and www-sites of the companies. Also, we review the relevant literature for theoretical approaches to interorganizational exchange and relationships. On the basis of the concept-centric literature review, we establish a classification scheme to categorize different software business models. The classification is used in the analysis of assets and capabilities in diverse software businesses.

In our comparative cross-case study, we selected six independent Finnish software vendors using company size and identified type of their business models as selection criteria. The companies represented each type of business model categories according to our previously constructed classification. The sample included software companies described as small and medium sized enterprises in the international scale. The interviews were recorded and transcribed. Due to commercial confidentiality, names of the companies remain undisclosed. The motive for choosing case companies with different business models was to provide a solid base for cross-case analysis to find out whether (and what kinds of) differences exist in the assets and capabilities of different software businesses. We conducted semi-structured interviews with senior management of the selected case companies. The field study process was conducted within 18-month period during April 2002-September 2003.

Empirical findings

In the empirical part of the study, we identify key assets and capabilities in different business models. Furthermore, we distinguish the resources that are developed internally from those that are acquired through networks. The external resources contain both purchased and non-purchased resources that are acquired or accessed through collaboration in networks. Acquired capabilities often seem to be related to the core competences of another actor in a network and, thus, remain as the resource of the provider.

Due to space limitations, we present the discrete cases in our multi-case study in a table format. A summary of our six case companies is presented in the Table 2.

Table 2 Summary of cases

Company	Years in business	Number of employees	Nature of offering	Customer relationship construct
Case A	40	>100	Model-based software products for narrow segments such as building and construction, and energy supply industries	Distribution through partners in different international market areas. The operation of these partners is facilitated by the company's internal network of country offices
Case B	~20	>100	Commercial-off-the-shelf enterprise software	Multiple customers through a network of distribution partners, including value added resellers, marketing partners and business consultants
Case C	5	<50	Software service business based on an automated model-based test generator	A multidimensional network structure that incorporates various strategic partners
Case D	35	>500	Human and financial resource management solutions with related services and process consulting	Customer relations through distribution partners that include domestic and international resellers, and complementary product or service vendors.
Case E	35	>100	Development, delivery and maintenance of information system solutions for statutory pension insurance companies	Intensive partnerships with customers to provide them with customized information system services and solutions.
Case F	5	<50	Video streaming and content mastering software and related services for DigiTV producers.	Primary customers also act as distribution channel partners and mediators to new markets.

The Case A was identified to represent a business model described as type IV in our classification scheme. Case B contained two separate businesses with distinct business models. They were positioned into categories III and IV and treated as separate business models in our analysis. The companies in Cases C, E and F conducted system

solution businesses with business models identified as type II in our classification scheme. Finally, the company in case D represents the largest corporation among our cases with three distinct business models, one of each identified to belong in categories I, II and IV in our classification scheme. Thus, we had at least one and three businesses at maximum in each of the four business model type categories.

Key assets in different business model categories

Our empirical observations indicate that both assets and capabilities differ according to the types of software business models. The identified assets that are developed internally vs. those that are obtained through networks are discussed next in association with different business model categories.

Type I: Software project businesses. The identified internal assets in the category of tailored software project businesses included production and consultation resources needed in both project implementation and sales. Hooley et al. (1998) have identified these assets as people (tangible asset) and their abilities (intangible assets). Key assets in this category that are obtained through network include procedures, such as project management methodologies, and systems (intangible assets).

Type II: System solution businesses. The key internal assets in the category of system solution businesses consist of human resources needed in systems development. This is reasonable, as this type of business requires sophisticated resources to develop commercial solutions of complex and multi-layered information systems. In addition to the internal assets, the businesses in this category develop and utilize software deployment assets (both tangible and intangible) through networks for successful implementation, integration and mobilization of information systems.

Type III: Transactional services and semi-finished solutions businesses. Analogously with the software project businesses, the key internal assets of businesses within this category are composed of production and consultation resources. As distinct from other business models, in this category operating facilities are relevant assets obtained through networks. These include e.g. server hotels, service hosting and Internet service provisioning. These assets have been identified in the literature (see e.g. Hooley et al. 1998) as operations and systems.

Type IV: Standard offering businesses. The businesses embodying standard offerings emphasize internal assets for product development and marketing. These include both tangible and intangible assets, such as products and technology, people and their

abilities, brands, intellectual property rights and databases. This is consistent with earlier studies (e.g. Durand 1997, Teece et al. 1997, Hooley et al. 1998). Distribution and supply networks, which contain both tangible and intangible elements, form the major asset obtained through networks.

Identified *capabilities* in different business model categories

Type I: Software project businesses. In tailored software businesses, mastering customer's business was identified as an essential internally developed capability. Especially customers' needs and logistic processes were emphasized in our cases positioned in this category. These findings are consistent with Möller and Törrönen (2003), who have identified the understanding customer's business logic, and an ability to propose major suggestions leading to business improvements, as specific indicators of this capability. The essential capabilities acquired through network included technological knowledge and project management skills and methods.

Type II: System solution businesses. The development of technological solutions for narrow segments was identified as a key internal capability in the cases within this category. Insight on specific solution domains and market segments were found important prerequisites and capabilities for this type of business. This is consistent with the strategy literature (e.g. Porter 1980) discussing focus strategies of businesses specializing on narrow customer segments. In addition to these, technological knowledge related to the selected domains and system integration capabilities were identified as key capabilities acquired through networks.

Type III: Transactional services and semi-finished solutions businesses. The cases in this category were generally seeking efficiency through operations management, which was found as an important internally developed capability. In addition, technological capabilities related to the development and composition of offerings emerged as key internal capability. On the other hand, production and process improvement capabilities in these cases were acquired through networks. We share the view of Möller and Törrönen (2003), who have identified technical specifications, flexibility and quality as indicators of production and process improvement capabilities.

Type IV: Standard offering businesses. In the category of standard offering businesses, capabilities related to production and technical innovation along with capabilities related to marketing and network management were developed internally. Instead, market sensing, business innovation and network development capabilities

were commonly acquired through networks. We offer a thought on network management as management of networks and management in networks depending on the actor's position in a value-creating network. This is consistent with the views presented in earlier studies by e.g. Möller and Svahn (2003).

Table 3 Identified key assets and capabilities in different business model types

Business Model Type		I “(Tailored) Software project business”	II “System solution business”	III “Transactional services and semi-finished solutions business”	IV “Standard offering business”
Assets	Internal	Production and consultation resources	Systems development resources	Production and consultation resources	Product development and marketing resources, products and technology, IPR's and brands
	External	Management procedures and systems	Software deployment networks	Operating facilities	Distribution networks
Capabilities	Internal	Capability of mastering customers' business	Development of technological solutions on narrow segments	Operations management and Technological capability	Production, network management, technical innovation and marketing capability
	External	Project management skills & methods and technological capabilities	Technological knowledge on new domains and system integration capabilities	Production and process improvement capabilities	Market sensing, business innovation and network development capability

In the literature there are other descriptions of assets and capabilities in connection with different business contexts (e.g. Gabriellson 2004, 100-102). However, they have not been classified according to particular business model types.

Discussion and Conclusions

To analyze the key resources in different software businesses, we identified four basic types of business models. We classified business models according to the selected dimensions summarized in our classification scheme. With this classification scheme, we identify four generic types of business models embodying characteristic ways of conducting software businesses. These could be further distinguished from each other by the variation of specific business model elements. We suggest that businesses within the same category share the characteristics of key resources. Furthermore, we assume that they differ from other categories in a way that provides rationale for analyzing the variety of key resources between different categories.

The findings of our cases illuminate the differences in internal and external resources within different business model types. In the business models embodying a high degree of involvement in customer relationships and a low level of homogeneity of offering, key assets are related to operations management, and key capabilities are related to intensive customer relationship and technological skills. The businesses with collaborative relationships in distribution and a high level of homogeneity of offering emphasize assets related to technological solutions and their development resources. Key capabilities in these businesses relate to the development and realization of complex technological solutions.

According to our empirical findings, in business models embodying transactional relationships and a low level of homogeneity of offering, key assets are related to the streamlined operational (development and delivery) processes. Also, the focus of identified capabilities is related to operational efficiency. The business models constituting transactional relationships and a high level of homogeneity of offering highlight assets related to product innovation and distribution. These kinds of businesses give emphasis to marketing and networking capabilities.

Our preliminary classification scheme was found feasible in analyzing different types of software businesses. However, we recognize that there are several other ways to categorize software business models. It remains an interesting issue whether another approach to business model categorization would lead to different outline of resources in software businesses. As a limitation of the current study, the sample was collected in relatively narrow geographical area around Helsinki - the capital of Finland. An interesting issue to be considered is whether the findings would be different in other geographical or cultural areas. Also, in this study we focused on small and medium sized enterprises. In other studies (e.g. Gulati et al. 2000, Möller et al. 2004) the scale of business is considered to be related to the network structures and the allocation of resources. Furthermore, the prior research of Chetty and Wilson (2003) suggests that the types of assets and capabilities and the ways they are achieved depend on the network configuration.

The network concept is still full of additional aspects to be taken into consideration when examining how companies create value through networks, including the analysis of power and dependency (e.g. Håkansson and Sharma 1996). Furthermore, the resource analysis related to business model change, and, the dynamics of key assets and

capabilities in the transition of a business model type are interesting issues. Due to space limitations, these considerations are left out of the scope of this study.

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