

Productization of knowledge-intensive business services: A managerial perspective

Katriina Järvi



Productization of knowledge-intensive
business services:
A managerial perspective

Katriina Järvi

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Finding a balance between efficiency and customer-orientation is a familiar challenge in all service companies. Productization of services has been suggested as one solution to this challenge, and it has become an approach favoured by consultants. The challenge is also well known among academics but the theoretical background has been scattered and the terminology varying – concepts such as standardisation, conceptualisation and modularisation have been used. The aim of this dissertation is to enhance understanding about productization through the clarification of concepts and the integration of practical applications to theories. There are several theories that have analysed the topic although the concept of productization has not been used. Such theories are service marketing, New Service Development, service engineering and service innovation.

The dissertation consists of an introduction essay and four articles. The research context is knowledge-intensive business services (KIBS). In KIBS companies, inefficient production of services is a typical problem because the complexity of KIBS offerings easily leads to a high degree of customisation and low generalisability. A multiple case study was carried out; the primary data consists of interviews in eight Finnish KIBS companies. Observation was used as a supplementary data collection method in the studies of two articles.

The dissertation provides new knowledge about the motives, challenges, benefits and effects of productization; also the antecedents of successful productization are included in the analysis. Both the development of internal collaboration and the emphasis on customer-orientation during productization have been examined. The study also links the perspective of innovation to productization. In the end of the study, a framework for customer-oriented productization in KIBS companies was developed.

The study provides three kinds of new knowledge. Firstly, it clarifies the concept of productization and distinguishes it from standardisation and other neighbouring concepts. By linking productization to central traditions of service research, it strengthens the theoretical basis of the concept. Secondly, the study provides new knowledge about productization of KIBS offerings, which have only rarely been studied from this viewpoint. Thirdly, the framework of customer-oriented productization crystallises the main phases of productization and the sequence in which these activities can be undertaken. Besides the theoretical contribution, the framework helps practitioners carry out productization more consciously and systematically.

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Tekijä

Katriina Järvi

Väitöskirjan nimi

Osaamisintensiivisten liike-elämän palvelujen tuotteistaminen: Johtamisnäkökulma

Julkaisija Perustieteiden korkeakoulu**Yksikkö** Tuotantotalouden laitos**Sarja** Aalto University publication series DOCTORAL DISSERTATIONS 126/2016**Tutkimusala** Teollisuustalous**Käsikirjoituksen pvm** 09.12.2015**Väitöspäivä** 16.09.2016**Julkaisuluvan myöntämispäivä** 06.06.2016**Kieli** Englanti **Monografia** **Artikkeliväitöskirja** **Esseeväitöskirja****Tiivistelmä**

Tasapainon löytäminen tehokkuuden ja asiakaslähtöisyyden välille on tuttu haaste kaikille palveluyrityksille. Palvelujen tuotteistamista on esitetty keinoksi tämän tasapainon löytämisessä ja tuotteistamisesta on tullut konsulttien suosima lähestymistapa. Myös tutkimuksen piirissä ongelma on tiedostettu, mutta teoriatausta on ollut löyhä ja käytetyt käsitteet kirjavia – aiheeseen on viitattu mm. käsitteillä standardointi, konseptointi ja modularisointi. Tämä väitöskirjatutkimus pyrkii lisäämään ja luomaan uutta tieteellistä tietoa tuotteistamisesta selkiyttämällä käsitteitä ja integroimalla käytännön ongelmat niihin teorioihin, joissa aihetta on analysoitu vaikka tuotteistamiskäsitettä ei ole käytetty. Tällaisia teorioita ovat palvelujen markkinoinnin teoriat, uusien palvelujen kehittämisen viitekehys, palveluiden suunnittelu ja palveluinnovaatioteoriat.

Väitöskirja koostuu johdanto-osasta ja neljästä artikkelista. Tutkimuksen kontekstina ovat osaamisintensiiviset liike-elämän palvelut (KIBS). Tämän alan yrityksille tehottomuus on tyypillinen ongelma, koska niiden tarjoamat palvelut ovat hyvin monimutkaisia, mikä usein johtaa asiakaskohtaisten ratkaisujen ylikorostumiseen ja heikkoon yleistettävyyteen. Tutkimusmenetelmänä on ollut laadullinen monitapaustutkimus. Aineisto koostuu kahdeksasta suomalaisesta KIBS-yrityksestä kerätystä haastatteluaineistosta. Havainnointia käytettiin täydentävänä menetelmänä kahden artikkelin tapaustutkimuksissa.

Tutkimuksen tavoitteena on ollut tuottaa tietoa KIBS-palveluiden tuotteistamisen tavoitteista, haasteista, vaikutuksista, hyödyistä ja onnistuneen tuotteistamisen edellytyksistä. Tutkimuksessa on analysoitu sekä yrityksen sisäisen yhteistyön että asiakasyhteistyön kehittämistä tuotteistamisen yhteydessä. Uutena asiana on tuotu esiin tuotteistamisen ja innovaatio toiminnan yhteys. Tutkimuksen lopuksi on tuotettu malli asiakaslähtöisestä tuotteistamisesta KIBS-yrityksissä.

Tutkimus sisältää kolmenlaista uutta tietoa. Ensinnäkin se määrittelee tuotteistamis-käsitteen ja erottaa sen standardoinnista sekä muista lähikäsitteistä; se myös vahvistaa tuotteistamisen teoriapohjaa kytkemällä ilmiön keskeisiin palvelututkimuksen suuntauksiin. Toiseksi tutkimus tarjoaa uutta tietoa KIBS-palveluiden tuotteistamisesta, josta aiempaa tuotteistamistutkimusta on vähän. Kolmanneksi tutkimuksessa luotu asiakaslähtöisen palvelun tuotteistamisen malli kiteyttää tuotteistamisprosessin päävaiheet ja osoittaa missä vaiheessa eri aktiviteetit voidaan toteuttaa. Teoreettisen hyödyn lisäksi tämä malli auttaa käytännön toimijoita toteuttamaan palveluiden tuotteistamista aiempaa harkitummin ja systemaattisemmin.

Avainsanat palveluiden tuotteistaminen, osaamisintensiiviset liike-elämän palvelut**ISBN (painettu)** 978-952-60-6889-3**ISBN (pdf)** 978-952-60-6890-9**ISSN-L** 1799-4934**ISSN (painettu)** 1799-4934**ISSN (pdf)** 1799-4942**Julkaisupaikka** Helsinki**Painopaikka** Helsinki**Vuosi** 2016**Sivumäärä** 206**urn** <http://urn.fi/URN:ISBN:978-952-60-6890-9>

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Oslo, June 10th 2016
Katriina Järvi

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List of Publications

This doctoral dissertation consists of a summary and of the following articles:

- I.** Valminen, Katriina; Toivonen, Marja. 2012a. Seeking efficiency through productisation. A case study of small KIBS participating in a productisation project. *The Service Industries Journal*. Volume 32, Issue 2, pp. 273–289.
- II.** Valtakoski, Aku; Järvi, Katriina. 2016. Productization of knowledge-intensive services: Enabling knowledge sharing and cross-unit collaboration. *The Journal of Service Management*. Volume 27, Issue 3, pp. 360–390.
- III.** Lehtonen, Mikko, H.; Järvi, Katriina; Tuominen, Tiina. 2015. Reflexivity in the productisation of services. *International Journal of Work Innovation*. Volume 1, Issue 2, pp. 161–184.
- IV.** Valminen, Katriina; Toivonen, Marja. 2012b. Towards user-based productisation in services. In Sundbo J, Toivonen M (eds.). *User-based Innovation in Services*. Edward Elgar, Celtenham, UK, pp. 375–393.

Author's Contribution

- I.** Valminen, Katriina; Toivonen, Marja. 2012a. Seeking efficiency through productisation. A case study of small KIBS participating in a productisation project. *The Service Industries Journal*. Volume 32, Issue 2, pp. 273–289.

The author of the dissertation had the main responsibility for the article. In particular, she planned the interview rounds and observations, collected and analysed all the empirical data and wrote the empirical findings. She also presented the earlier version of the article in the Annual Conference of European Association for Research on Services (RESER), 12–15 September 2007, Tampere, Finland. The theoretical part and the framework were developed in collaboration with Marja Toivonen.

- II.** Valtakoski, Aku; Järvi, Katriina. 2016. Productization of knowledge-intensive services: Enabling knowledge sharing and cross-unit collaboration. *The Journal of Service Management*. Volume 27, Issue 3, pp. 360–390.

The theoretical part was developed and written together with Aku Valtakoski. The author was responsible for planning of and collecting all the empirical data in one of the two cases (case “Green”). In the other case (Case “Blue”) the data collection was carried out together. The data analysis was done in collaboration. The author of this dissertation presented the earlier version of the article in the European Academy of Management (EURAM) Conference, 6–8 June 2012, Amsterdam, Netherlands.

- III.** Lehtonen, Mikko, H.; Järvi, Katriina; Tuominen, Tiina. 2015. Reflexivity in the productisation of services. *International Journal of Work Innovation*. Volume 1, Issue 2, pp. 161–184.

Theoretical work in this article was shared between all authors: Mikko H. Lehtonen, Tiina Tuominen and the author of this dissertation. The author had the main responsibility for the theoretical discussion on service productization and codification. She also took a central role in planning the interview rounds and formulating the interview themes and questions. She had the main responsibility for carrying out the interviews. The analysis was conducted by Mikko H. Lehtonen and the author. They interpreted the data and summarised the findings.

- IV.** Valminen, Katriina; Toivonen, Marja. 2012b. Towards user-based production in services. In Sundbo J, Toivonen M (eds.). *User-based Innovation in Services*. Edward Elgar, Cheltenham, UK, pp. 375–393.

The author of this dissertation had the main responsibility for this theoretical article. The work was guided by Marja Toivonen. The author of this dissertation also presented the earlier version of the article in the Annual Conference of European Association for Research on Services (RESER) 30 September – 2 October 2010, Gothenburg, Sweden.

1. Introduction

1.1 Background: the productivity challenge in services

Modern economies are service economies: for several decades, services have been the main source of wealth and jobs (Drucker, 1991; Illeris & Philippe, 1993; Miles, 1993). In developed countries, service sectors comprise approximately 70-80 percent of the gross domestic product (GDP) and employment (Anderson et al., 2013; Tether et al. 2001; Wölfl, 2005). Also manufacturers increasingly add services into their total offering to achieve steadier income flows and smaller sensitivity to economic fluctuations (Léo & Philippe, 2001). An important observation is that the service economy has developed hand in hand with the advancing information and knowledge economy (Castells, 1996; Miozzo & Miles, 2003). The low skill nature that earlier was considered characteristic of services is no more valid: an increasing part of services are knowledge-intensive (Gallouj, 2002; Hipp & Grupp, 2005; Howells et al., 2004).

The growth of services in the economy has brought with it several benefits in terms of new assets for competitiveness and new ways to meet customer needs. However, it is not without problems. One of the main criticisms has concerned *the low productivity of services* – a problem that was identified in the late 1960s (Baumol, 1967). Since the early 1980s, both the socio-economic service scholars focusing on the sector level (Bryson & Daniels, 2007; Daniels, 1983, 2004; Gallouj & Weinstein, 1997; Gershuny & Miles, 1983; Illeris, 1989), and the representatives of the service marketing school focusing on the offering level (Grönroos & Ojasalo, 2000, 2004; Gummesson, 1988; Johnston & Jones, 2004; Parasuraman, 2002, 2010; Zeithaml et al., 1985), have discussed the problem in more detail. The suggestion for productizing services is one stream in this discussion: productization aims to increase the scalability of services and in this way answer the challenge of low productivity.

The concept of productivity is viewed somewhat differently by different scholars. As the concept derives from the manufacturing context, many service scholars have criticised it (e.g. Gummesson, 1998, 2014; Klassen et al., 1998; Molander, 2013). Basically, productivity refers to the ability of a production process to generate the expected and desired outcome with the minimum usage of resources (Djellal & Gallouj, 2008; Tangen, 2005). Problems arise from the fact that productivity involves two components: *efficiency* (input in rela-

tion to output) and *effectiveness* (achievement of the goals set) (Chase & Aquilano, 1992; Starr, 1996). In the service context, the former has been usually linked to the provider's viewpoint whereas the latter has been seen to represent the customer's viewpoint (Neely et al. 1995). Efficiency reflects the service provider's striving for profitability and competitiveness and includes cost efficiency, scale efficiency and technological advance (Varian, 1984; Kreps, 1990). Effectiveness indicates the consistency of the service outcome in relation to customers' needs, expectations and perceived value (Blois, 1984; Tangen, 2005). In services, separating the two components is difficult due to the central role of co-production: the participation of the customer in the service process (Abramovici & Bancel-Charensol, 2004; Alvesson, 2004; Løwendahl et al., 2001; Sundbo & Gallouj, 2000). The phenomenon of co-production makes the efficiency of the provider highly dependent on the input of the customer (Porter, 1985; Sampson & Froehle, 2006).

Some researchers have suggested the replacement of the productivity concept with the concept of performance due to easier re-consideration possibilities, i.e. less tight linkages to a straightforward input-output analysis (Djellal & Gallouj, 2009). This suggestion also aims to broaden the perspective from the quantitative measurements, which have been a common approach in this context and assume that productivity of services and manufacturing can be measured unequivocally (cf. Metcalfe & Miles, 2006). In order to enable qualitative studies, too, Djellal and Gallouj (2009, p. 11) define performance as "the improvement in the 'positions' or 'operating efficiency' relative to the various outputs". They highlight that the performance of a given economic activity is not an objective category but is considered in different, even contradictory terms depending on the actors concerned (individuals, firms etc.). The subjective nature of performance is particularly pronounced in the information and knowledge economy, which is based on intangible, abstract and socially constructed factors of production.

Other researchers have argued in similar lines, keeping however the concept of productivity. Several scholars representing the marketing school have modelled service productivity as an interactive process highlighting the linkage between the producer's and the customer's productivity (Zeithaml et al., 1985; Gummesson; 1988; Grönroos & Ojasalo, 2004). Even though the phenomenon of co-production and the simultaneity of production and consumption in many services restricts the possibility of generalisations (Parasuraman, 2002; Johnston & Jones, 2004), a valuable point is modelling the service productivity in its actual context. The analysis is guided by the pragmatic needs to enhance the competitiveness of services, which is examined from the dual perspective of the customer and the provider. This kind of a view on service productivity can also be linked with the issues of the firm's competitive advantage and organisational capabilities (Viitamo, 2008a, 2008b). Here, the intangible characteristics of service productivity can be addressed through the tangible char-

acteristics of the organisation, as the service practice reflects the organisation (Preissl, 2000).

This dissertation follows the footsteps of the above-described broader applications of the concept of productivity. In addition to the basic view on the concept, it is important to define the level of analysis, because productivity can be studied at various levels of the economy. At the macro level, it describes the performance of the entire economy; at the industry level, it reflects opportunities and constraints in specific industries. In this dissertation, the focus is on the third level: companies and organisations where productivity refers to the competitiveness of products, services, activities and business units (cf. Viitamo & Toivonen, 2013).

1.2 Productization as a way to tackle the productivity challenge

The productivity challenge in services is tightly linked with the view about the nature of services; more specifically, about their differences compared to goods. Immateriality and inseparability of the outcome and the process have been regarded as service characteristics that do not enable the combination of effectiveness and efficiency in the way, which is possible in the case of goods (Klassen et al., 1998). However, while the differences between goods and services were highlighted in the past (cf. Sampson & Froehle, 2006), more recent research has emphasised similarities and the convergence of development. Newer analyses of goods have shown that tangibility is a relative issue. Normann (2001, pp. 114 and 117), for instance, suggests that physical products represent “frozen knowledge” which designers, producers and users have given rise to, and a platform on which economic actors can link with others. A process configuration is an essential part of this knowledge (cf. Spring & Araujo, 2009). As regards services, questioning their immaterial nature has recently come to the fore. Service materiality may manifest itself in the service medium or target, in the physical spaces of production and/or consumption, in the production factors deployed in the service relationship, or in the mobility linked to the process of co-production (Djellal & Gallouj, 2016; Fourcroy et al., 2012).

The similarity between goods and services is crystallised in the notion that both of them are products (Gallouj & Weinstein, 1997; Vargo & Lusch, 2004) – also termed “offerings” (Spring & Araujo, 2009). *Strengthening and making visible the product nature of a service is the basic idea in productization.* Central means are the division of the service into separate elements and the clarification of relationships between these elements (Gallouj & Weinstein, 1997; Sundbo, 1994).

The process of productization refers to the activities in which the contents of a service is systematised and formalised (cf. Gallouj & Weinstein, 1997). Complete standardisation is not the aim of productization, but rather the develop-

ment of the basic processes and structures that are then complemented with case-specific elements – in services, some degree of flexibility is needed in order to respond to customer demands in each service encounter (cf. Brax, 2013; Edvardsson, 1997; Sundbo, 2002). Productization also involves knowledge sharing: service providers attempt to adopt best practices and learn how to work with productized service elements (Løwendahl et al., 2001; Morris, 2001; Sundbo, 2002).

Besides productization, several other concepts have been used in the academic literature. In the early stages, the imitation of manufacturing was pronounced and led to the adoption of the concept of industrialisation (Levitt, 1972). The concepts of standardisation (Tether et al., 2001) and commodification (Coombs & Miles, 2000) also favour manufacturing-type processes and manufacturing-based views on the nature of the outcome, but they can also be interpreted without the idea of direct imitation. A fourth concept used sometimes synonymously with productization is systematisation of services (Lidén & Sandén, 2004). It is a neutral but very general concept, not directly pinpointing the issue to be solved. Other concepts have a more restricted meaning: they describe a specific stage in productization or a specific means to design the offering. Commonly used are “codification” which highlights the structuring of knowledge (Ancori et al., 2000; Cowan et al., 2000); “conceptualisation” (concept development) which refers to the clarification of the basic promise included in the service (Clark et al., 2000; Goldstein et al., 2002); and “modularisation” which suggests the division of the service process or the offering into separable elements (Bask et al., 2010; Sundbo, 1994).

In this dissertation, “productization” has been selected as the core concept for several reasons. Firstly, the aim is to avoid antagonism between goods and services – a concept referring to their common characteristics without an idea about the imitation of manufacturing fulfils this aim. Secondly, the dissertation examines the entire process, not a particular stage in the development whose purpose is to make services more visible. Particular stages are, however, discussed when they come to the fore as sub-themes of the work. Thirdly, in addition to the theoretical examination, this dissertation emphasises the managerial viewpoint: how to productize services successfully.

1.3 Managerial aims and challenges of productization

The challenge of productivity is well known among practitioners. Even though the concept of productization is increasingly used in academic literature, it is still more popular in the managerial context: management-oriented magazines, seminars and books are the main sources in which the concept can be found (Cross & Paquette, 2014; Jaakkola et al., 2007; Sipilä, 1999; Werr & Stjernberg, 2003). The managerial aims have been to increase the efficiency and effectiveness of service operations, to simplify customer interaction, and to improve the marketability of services (Jaakkola, 2011). There is divergence

whether productization concerns mainly the customer interface or whether it is seen more as an issue of organisational development. In the former case, the main aim is to make the service offering and the service provider's expertise more concrete in the eyes of customers. For example, service descriptions and other marketing material, and brand names and visual identities for the services are used to facilitate communication with the customers. Moreover, service productization is used to tangibilise the company's competence and trustworthiness (ibid.).

In the latter case, productization is used to facilitate organisational learning and the efficient exploitation of human resources (Werr & Stjernberg, 2003). Productization accumulates insights about service elements and the ways of interacting with customers (Løwendahl et al., 2001; Morris, 2001; Sundbo, 2002). Managers also use productization to promote cross-unit collaboration in-house and turn employees' expertise into an organisational rather than individual asset. Several means are applied in this context, including spreading knowledge in a codified form of manuals and guidelines, and eliciting employee's views with process mapping techniques, such as service blueprinting (Bitner et al., 2008).

Practice-oriented literature sometimes glorifies productization, and emphasises its positive effects. However, productization also includes challenges. Combining efficiency with customer-orientation is such a challenge (Gallouj & Savona, 2009; Johnston & Jones, 2004). Efficiency is linked to the scalability of services; as discussed earlier, it reflects the service provider's strive for profitability and competitiveness (Viitamo & Toivonen, 2013). Customer-orientation includes quite a different purpose: it aims to offer a unique experience for the customer in individual encounters (cf. Johnston & Jones, 2004). Customer-orientation is *"the set of beliefs that puts the customer's interest first, while not excluding those of all other stakeholders such as owners, managers, and employees, in order to develop a long-term profitable enterprise"* (Deshpande et al., 1993, 27). Customer-oriented companies strive for superior customer value and enhanced customer satisfaction (Hartline et al., 2000; Kim & Mauborgne, 1999) by discovering both expressed and latent customer needs through the use of different techniques (Ojasalo, 2001; Slater & Narver, 1998).

Success in service business is not possible if the provider only tackles one challenge and neglects the others (Molander, 2013). The one-sided emphasis on customer-orientation may lead to totally tailor-made practices where the insights emerging at the customer interface do not accumulate into shared understanding, and where the interaction with customers is highly dependent on the skills of individual staff members. Correspondingly, the one-sided emphasis on efficiency may lead to mechanical input-output considerations which answer the needs of users poorly and consequently do not form a sustainable strategy in the longer term (Gummesson, 2014). In recent years, service productization has been developed to a direction which seeks balance between

systematisation (efficiency) and tailoring (customer-orientation) (Jaakkola, 2011).

The phenomenon of co-production (Sundbo & Gallouj, 2000) implies that both the service process and the outcome of this process are uniquely experienced by the customer in a single delivery situation (Bitner et al., 2008; Edvardsson, 1997). In companies and organisations, productivity focuses on the question whether this unique frontline experience can be combined with systematic back-office processes. Thus, the aim of productization is the development of basic activities and structures that are then complemented with case-specific elements to respond the customer demands in each service encounter (Brax, 2013; Edvardsson, 1997; Sundbo, 2002). In the broadest sense, productization is understood strategically: it can be used as a means for the development of the entire business.

1.4 Research context: knowledge-intensive service companies

In the case studies of this dissertation, the empirical context is companies providing knowledge-intensive business services (KIBS). The concept of KIBS was originally adopted by Miles et al. (1995, 28) to refer to consultancy- and design-type services that expert companies provide to other companies and organisations. Typical KIBS are IT services; R&D services; technical consultancy; legal, financial and management consultancy; and marketing communications services (Amara et al., 2009; Strambach, 2001). Characteristics of KIBS companies are a high share of expert labour and a central role in the knowledge formation of clients (Miles, 2005; Consoli & Elche-Hortelano, 2010).

KIBS are part of a larger group of business services. Business services can be defined as “services that companies or organisations provide to other companies or organisations and that are intermediate by nature i.e. they are inputs in the manufacturing processes or in the production of other services” (Toivonen, 2004, 34). The relativity of the concept “knowledge-intensive” has become apparent. When defining specific sectors as KIBS, Miles et al. (1995) stated that the sectors pointed out were more knowledge-intensive than others at that time, but in the future other sectors may also feature as an arena for knowledge-intensive services. Today many sectors that are not specialised in expert offerings resemble KIBS. For example, manufacturers do not offer only maintenance and repair services but more and more also KIBS-type services (Mathieu, 2001). Thus, instead of considering industrial services and KIBS as two completely different types of services, it is suggested that also manufacturing companies can provide KIBS-type services (Brax, 2013; den Hertog, 2000).

Since the mid-1980s, KIBS have been the fastest growing economic sector in all developed countries (Simmie & Strambach, 2006; OECD, 2006). As KIBS companies are specialised in certain expert areas, they can provide higher-

level know-how than the customer for special tasks. Similar tasks with many customers means a continuous accumulation of experience in KIBS companies, and the improvement of solutions provided to the customers (Zhang & Li, 2010). This also provides KIBS with an “objective” perspective that can be used to facilitate necessary organisational changes of customers (Bessant & Rush, 1995). As the complexity of products and services grows, companies no longer have all the knowledge within their own organisation (Contractor et al., 2010). Thus, openness to external knowledge sources is increasingly important to be and stay competitive and innovative (Caloghirou et al., 2004).

The rapid growth as such makes KIBS an interesting research area when the efficient and effective production of services is in the spotlight. However, besides their growth, KIBS have aroused interest as an essential part of the knowledge and innovation infrastructure of national and regional economies (Corrocher et al., 2009; den Hertog & Bilderbeek, 2000; Gallouj, 2002; Miles, 2005). KIBS have a close linkage to the development of today’s knowledge economy because knowledge is both their main input and output (Gallouj, 2002). The creation of new knowledge in a joint learning process between KIBS companies and their customers is the core idea of knowledge-intensity (Miles et al., 1995). KIBS companies have been suggested to promote innovations in two ways: innovations emerge in them and through the use of their services. In other words, KIBS companies are active innovators, and they are facilitators of innovation activities in their client organisations and disseminators of innovative outcomes in the economy (Hipp & Grupp, 2005; Miles et al., 1995; Miles, 2005).

The role of KIBS as facilitators of innovation is based on their specialisation, which often derives from an academic discipline (Consoli & Elche-Hortelano, 2010): in certain expert areas, KIBS companies have such a level of know-how that the clients cannot achieve. Aggregating similar work over many clients means a continuous accumulation of experience and the respective improvement of solutions regarding the clients’ problems (Wolpert, 2002; Zhang and Li, 2010). The growing complexity of products and services increases the need for external help: the clients do not have all the necessary but diverse knowledge within their own organisation (Bilbao-Osorio & Rodríguez-Pose, 2004; Contractor et al., 2010). Also the adoption of knowledge inputs into practice increasingly requires professional help: this input has to be converted into such types of knowledge that enable the applications in a specific context (Caloghirou et al., 2004).

The role of KIBS companies as carriers of innovation refers their role as “bridging intermediaries”: KIBS companies disseminate innovations by combining different knowledge sources and knowledge users, based on their contacts with various clients and other stakeholders (den Hertog & Bilderbeek, 2000). The role as sources of innovations is based on KIBS’ versatile and con-

tinuously renewed offerings (Gallouj, 2002) – KIBS have to continuously accumulate and update their own knowledge base (den Hertog, 2000).

However, while the advancing knowledge economy drives the development of KIBS, it also poses challenges. Productivity is one of these challenges. Combining efficiency with customer-orientation is a general challenge in services (Gallouj & Savona, 2009; Johnston & Jones, 2004), but it is highlighted in KIBS. As stated above, interactive learning between the provider and the customer plays a central role in KIBS transactions and supports the emergence of new insights (Miles et al., 1995; Miles, 2005). On the other hand, it may mean reliance on fully tailor-made services, starting from scratch for each client. Characteristics that easily maintain excess customisation are the highly complex and heterogeneous nature of expert offerings, and the intensive participation of clients in the problem diagnosis and the service production process (Alvesson, 2004; Bettencourt et al., 2002; Løwendahl et al., 2001; Morris & Empson, 1998). Moreover, there is also an increasing pressure that KIBS should understand deeply the client's value creation process and strategy (Fosstenlökken et al., 2003). This means that there is need to put extra emphasis on understanding and organising the co-production relationship when productizing KIBS offerings.

1.5 Research gaps and research questions

Despite the topicality of productization, the academic discourse concerning it is scattered and applies variable terminology. Thus, one of the overall aims of this dissertation is to clarify the concept and show more explicitly how the different service theories can be utilised in the creation of understanding of the incentives, nature and benefits of productization. The aim also includes bridging between theoretical and managerial literature; the latter is rapidly growing (Cross & Paquette, 2014; Jaakkola et al., 2007; Werr & Stjernberg, 2003) but develops separately from theoretical analyses and shows to some extent “ad hoc” features which diminish the possibilities to utilise its findings for academic purposes. Work for the conceptual clarity and theoretical deepening has been started in the articles and it has been continued in the literature review of this introduction essay. Sub-chapter 2.2.2. depicts how the concept of productization is related to its neighbouring concepts. Sub-chapter 2.3. analyses views on its contents in relation to four research traditions on service development (service marketing, New Service Development, service engineering, and service innovation).

A view throughout the dissertation is that productization can be linked both to the further development of existing services and to the innovation of new services. The latter linkage is particularly important because it highlights that the point is not standardisation but creative elements are well in line with the idea of productization. In the research on service innovation, this notion is implicitly included: the search for generalizable insights and replicable offerings on

the basis of individual solutions has been regarded as an essential characteristic of service innovation processes (Gallouj, 2002; Preissl, 2000). However, productization has not been explicitly raised to the fore in the context of service innovation. Correspondingly, in the literature on productization (and in the literature using the neighbouring concepts), there is a lack of approaches that consider how innovation and productization could benefit each other.

In terms of various types of services, a particular research gap concerns the productization of non-routine services. Actually many studies have divided services into two groups: those allowing standardisation and those necessitating customisation (e.g. Tether et al., 2001). Expert services based on professional knowledge (KIBS) have been considered typical representatives of the latter group. Studies on the process through which KIBS companies develop marketable offerings are scarce (e.g. Clark, 2004). On the other hand, as KIBS companies are a core sector in the present economy, it is increasingly important that they can provide their services efficiently and effectively, which means that the issue of productization cannot be ignored in them. This dissertation aims to contribute both the theoretical and managerial understanding of this issue.

The research gaps that the dissertation aims to narrow can be summarised as follows: 1) the gap linked to concept clarification, 2) the gap linked to the integration of different theoretical perspectives, 3) the gap concerning productization of non-routine services, and 4) the gap concerning deeper understanding about concrete issues and practices of productization in the intra-organisational context and in the customer collaboration. Based on these research gaps, the research questions of this dissertation are the following:

1. *Why to productize KIBS offerings: what are the motives, perceived benefits and effects of productization in the context of KIBS?*

Due the complex nature of KIBS, KIBS offerings have traditionally been highly customised, and it has been common to end up in unique situations where solutions are strongly based on the specific context and needs of the particular customer. However, increased efficiency is neither the sole motive nor the sole benefit of productization. Also the effects of productization vary, and are not always positive. Hence this dissertation aims to identify what are the motives and incentives for productization in KIBS companies, and what are its perceived benefits and effects. This research question has one sub-question:

1.1. *What are the effects of productization on reflexivity?*

This sub-question explores the effects of service productization with the special focus on reflexivity. Reflexivity refers to the ability to evaluate and relate to on-going action, structures, and the self. Reflexivity is embedded in daily work, where employees continuously build understanding about their environment

and practices based on their knowledge, experiences, and imagination. In knowledge-intensive work, the role of reflexivity is emphasised, as work assignments are often ambiguous and require employees to define problems in order to develop the necessary knowledge to solve them. Thus, reflexivity is an integral part of human action, but little is known about the influence of work changes on it.

Productization efforts are typically management-initiated and may induce resistance among KIBS employees. One reason for this resistance is that individual knowledge is a source of status and employees may fear that explication and codification of knowledge weakens their status (Heusinkveld & Benders, 2005; Morris, 2001). Thus, reflexivity is needed to balance between standardisation and customisation, both within productization processes and within the service processes that are the target of productization. With this sub-question, the dissertation explores how productization affects reflexivity in KIBS companies and which kind of different effects it causes in different contexts.

2. *How to productize KIBS offerings: what kinds of activities are essential when KIBS companies productize their offerings?*

Productizing KIBS offerings concerns offerings whose content is knowledge, which means that immateriality is highlighted and makes the task especially challenging. Through this research question, this dissertation examines, how KIBS companies can productize their offerings successfully. The research question has three sub-questions:

2.1. *What are the antecedents for successful productization?*

Knowledge-intensive work requires combining existing knowledge with new knowledge. In this context, challenges arise especially in capturing and transferring interpersonal knowledge (Løwendahl et al., 2001). The knowledge of employees, which concerns customer needs in particular and accumulates in service delivery over time, is critical for the successful service development in KIBS. Thus, one main task in these companies is to create common understanding of this knowledge (Jaakkola, 2011): transform knowledge from tacit to explicit, codified knowledge, and collect individual employees' knowledge into collective knowledge (Morris & Empson, 1998; Suddaby & Greenwood, 2001).

Knowledge as a status issue was already raised in the context of the research question focusing on reflexivity. The paradox inherent in productization is that its success depends on employees' willingness to transfer knowledge and cooperate as individuals (Morris, 2001; Morris & Empson, 1998; Reed, 1996). Only scant research exists on the actual success of service productization (Amara et al., 2009, 2010; Corrocher et al., 2009; Leiponen, 2005), which makes the exploration on the basis of this sub-question very important.

2.2. *How could productization and innovation be interlinked?*

Repeatability and transferability have been argued to be essential components of the definition of innovation (Drejer, 2004; Tuominen & Toivonen, 2009). Actually, some form of systematisation typically takes place during all types of service innovation processes, as it is necessary to the organisation-wide implementation of an innovation (Menor et al., 2002; Stevens & Dimitriadis, 2005). However, as mentioned in the research gaps, innovation literature does not include an explicit discussion on productization and productization literature does not consider how the perspective of innovation could benefit this practice. The second sub-question aims to narrow this gap: it explores how productization and service innovation could be combined into mutually supporting processes.

2.3. *How could the target and process of productization be combined into a framework, which promotes a customer- (user-) based approach?*

Earlier productization studies (and studies based on its neighbouring concepts) have focused either on the target of systematisation (the service) or on the way in which a productization process could be organised. However, these two aspects go often hand in hand. Thus, there is a need for a framework which combines the two perspectives, and sub-question 2.3. is a starting point for the production of such a framework. The close collaboration with customers and users should be taken into account in this framework, as maintaining the customer perspective and taking into account the co-production relationship are critical for successful productization in KIBS (Aarikka-Stenroos & Jaakkola, 2012). Thus, this dissertation aims to provide a framework for customer-oriented productization, which opens up both the process and the target (the service) of this effort in KIBS.

As a whole, including both the introduction essay and the four articles, this dissertation aims to contribute to service innovation research, knowledge-intensive services research and service research in general. In addition, managers and those working with service development in companies may find the results useful in practise. Thus, the purpose is to contribute both to the theoretical and managerial understanding of productization. Table 1 below summarises the research questions of this dissertation.

Table 1. The research questions

1. Why to productize KIBS offerings: what are the motives, perceived benefits and effects of productization in the context of KIBS?

1.1. What are the effects of productization on reflexivity?

2. How to productize KIBS offerings: what kinds of activities are essential when KIBS companies productize their offerings?

2.1. What are the antecedents for successful productization?

2.2. How could productization and innovation be interlinked?

2.3. How could the target and process of productization be combined into a framework, which promotes customer- (user-) based approach?

1.6 Structure of the dissertation

This introduction essay consists of five chapters. After the present chapter, the second chapter includes the literature review. It starts from the analysis of the nature of services as a background topic and then focuses on productization: the contents of the concept and the key literature streams linked to it. Also theoretical discussion on KIBS is included. The chapter ends with a summary.

The third chapter describes the methodological choices in the empirical articles (I, II and III). The chapter starts by presenting the case study approach and how it has been applied in the different studies included in this dissertation. The case companies and the data collection and analysis are then described. The empirical material derives from eight Finnish companies. The main data collection method in all cases was semi-structured interviews. Non-participant and participant observation was used as a supplementary method in cases presented in articles I and II. Secondary data, such as service descriptions, annual reports and workshop memos, was used to complement the interview and observational data in the cases presented in articles I and II. The chapter ends with evaluating the trustworthiness of the whole research.

The fourth chapter summarises the key findings of each of the four articles. *Article I* examines the general issues of productization in small KIBS: incentives and motives behind productization and its benefits and effects. *Article II* explores the antecedents of productization success in KIBS. *Article III* supplements the analysis of effects of productization. Compared to article I, its focus is more on KIBS employees and their work practices and less on the organisational perspective. In particular, it examines reflexivity in productization, and how productization has different effects in different social contexts. *Article IV* is a conceptual article that supplements the general and intra-organisational issues and phases of productization discussed in the first three articles with the perspective of user collaboration. It explores the underpin-

nings for user-based service productization and brings to the fore the linkages between productization and innovation. The original articles are presented in Appendices I–IV.

The fifth chapter discusses first the key findings and theoretical contributions of the study in relation to the research questions. Thereafter, it suggests managerial implications concerning the practices of productization. The chapter ends with suggestions for the avenues of future research.

2. Literature review

The literature review discusses the theoretical topics on which this dissertation is based and which form the starting point for its empirical studies. The review starts from a brief summary of the views on the nature of services (the first sub-chapter) and then continues to the analysis of the productization concept (the second sub-chapter). Here, neighbouring concepts are discussed one after the other in order to create a firm basis for the selection of the concept of productization (a short justification was already given in the introduction). Also, the definition of productization is formulated to be applied in this dissertation. The third sub-chapter aims to strengthen the theoretical basis of productization – which has been scattered and often purely managerially oriented as mentioned before. The linkages of four service research traditions to productization are examined and the contribution of each of them is evaluated: service marketing, New Service Development (NSD), service engineering, and service innovation. The fourth sub-chapter deepens the discussion on KIBS – the context of this dissertation. The nature of KIBS offerings and the need and challenges of productization in KIBS companies are discussed in more detail. The literature review ends with a summary.

2.1 The nature of services

Along with the growth of the service economy during the last forty years, the attention to services has increased substantially both in research and in business. Simultaneously, there have been great difficulties in finding an adequate definition for this part of the economy (Gadrey, 2000). Since the beginning of service research, scholars have identified several meanings for the concept of services: it can refer both to service *activities* and to the *end results* of these activities; sometimes it is also used to mean service *industries* or service *occupations* (Gershuny & Miles, 1983; Illeris 1989). Today, there is an additional ambiguity deriving from the separation of “services” (plural) from “service” (singular) in the stream of service-dominant logic. This research stream defines “service” in terms of value co-creation between the provider and the beneficiary while “services” are defined as immaterial goods (Vargo & Lusch, 2004, 2008).

The most common solution for the definitional problem has been to describe characteristics that separate services from goods. The immaterial nature and the indispensability of the product from the process have been generally recognised as central characteristics (Sundbo & Gallouj, 2000). On the other hand, the servitization of manufacturing (Howells et al., 2004) and the advancing digitalisation (Leminen et al., 2014) have brought to the fore the question whether a sharp separation between goods and services is purposeful at all. This question, as well as the general topic of the characteristics of services, has been discussed within two main research streams: the “school” of service marketing and management, and the community of socio-economic service researchers (economists, sociologists and other social scientists often having the perspective of innovation).

Within the “school” of service marketing and management, the IHIP categories (inseparability, heterogeneity, intangibility and perishability) have been the traditional way to define services (Edgett & Parkinson, 1993; Zeithaml et al., 1985). Nowadays, several scholars (e.g. Brax, 2013; Edvardsson et al., 2005) have suggested that they are not generally valid or not characteristic of services only. Information and communication technologies have made services separable in space and time, and heterogeneity is increasingly typical in goods sectors, too. Many services include tangible elements (retailing is an illustrative example), and perishability concerns only concrete processes but not the know-how accumulating in them. An important counter-argument against the usefulness of the IHIP categories is also the point that they describe services through the lens of the provider and do not take into account the input and activities of the customer. Thus, the IHIP categories do not capture the interactive nature of services and are not related to co-production, value creation and consumption of services (Edvardsson et al., 2005; Brax, 2013; Lovelock & Gummesson, 2004).

Today, the majority of marketing scholars consider that the essence of services is that they are activities, deeds or processes in which the role of customers is central as the recipients and often also as the co-producers of the solution. Grönroos (1990, 27) has defined this basic idea as follows: *“A service is an activity or series of activities of more or less intangible nature that normally, but not necessarily, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems”*. For the purposes of productization, particularly useful are more specific definitions that rely on the modular division of a service. Brax (2013, 111) has recently defined a service as a modular process-based (MPSD) phenomenon. According to her, service offerings are complex, multi-component offerings, and combinations of a number of parts, components or elements: *“Services are offerings in which at least core part of the market exchange between provider and a customer is provided in the form of process-based components that are in-*

separable from their production resources and co-involve both parties" (Brax, 2013, 111).

The definitions created within the domain of socio-economic research show similar features with the marketing "school", but include some specific emphases, too. Gadrey (2000, 382-383) has formulated one of the most well-known definitions in this field. It characterises a service as a purchase, which provides useful effects without the change of ownership. According to him, *"Any purchase of services by an economic agent B (whether an individual or organization) would, therefore, be the purchase from organization A of the right to use, generally for a specified period, a technical and human capacity owned or controlled by A in order to produce useful effects on agent B or on goods C owned by agent B or for which he or she is responsible."*

A typical analysis framework in the socio-economic service research has been the comparison between goods and services or manufacturing production and service production. Three views have been separated: assimilation, demarcation and synthesis (Coombs & Miles, 2000; cf. also Gallouj, 2002). These views have been applied in the context of service innovation in particular (Carlborg et al., 2014; Drejer, 2004), but they also illustrate a more general stance towards the nature of services. According to the assimilation approach, services are supplementary to manufacturing, and the ways in which manufacturing and technological fields have developed should be set as an ideal in services, too (den Hertog, 2010). The demarcation approach can be seen as a counter-reaction: it argues that specific theories are required to understand the nature and dynamics of services (Miles, 2016). In these theories, attention should be paid to implications following from the intangible and co-produced nature of services. An important implication is that the interaction with customers makes it impossible to separate between the product and the process (Preissl, 2000).

The third approach is synthesis, which highlights the need for common models that would help in understanding both material and immaterial offerings and would support efficient and effective processes in their production (Coombs & Miles, 2000; Gallouj 2002). This approach has become increasingly relevant along with the blurring boundaries between goods and services (Gallouj & Savona, 2009). Services are an integral part of the change processes in individual products and in the transformation of value chains, entire industries and other elements of societal systems (Janssen, 2015). Thus, rather than seeing services as fundamentally similar or different from goods, the synthesis approach aims to create frameworks which are applicable in both services and manufacturing (Carlborg et al., 2014). The synthesis view provides a good starting point for the development of productization: the idea is not to imitate manufacturing processes but excess emphasis on the peculiarities of services is also given up.

2.2 The concept of service productization

Even though the concept “productization” is not commonly used in academic literature, the idea has been actively debated for decades. This sub-chapter provides first a general overview on the evolution of this debate. Thereafter, the concept of productization is compared to its neighbouring concepts and a preliminary definition to be used in this dissertation is given.

2.2.1 The evolution of the debate on service productization

Three phases can be identified in the academic debate linked to the productization of services. These phases reflect a change in the perspective: its focus has moved from the general competitiveness of companies to managerial issues in service processes and further to specific perspectives and tools to be used. In the following, the core argumentation in each phase is briefly presented.

1. The industrialisation debate. The roots of this debate can be traced back to the early days of “service/services marketing” research in the 1970s and 1980s, when the issue of efficiency in services was raised. One of the first authors tackling this issue was Levitt (1972), who argued that service companies should “apply the kind of technocratic thinking” that is general in manufacturing. His views can be justifiably criticised for the idealisation of manufacturing and for the simplification of the nature of services. Levitt ignored the variety of services, and his examples were selective – which the use of supermarkets and fast-food restaurants as best practice cases illustrates. However, the argumentation favouring industrialisation continued strong through the whole 1980s. The assimilation approach to services (den Hertog, 2010), presented in the former sub-chapter, is actually very near to the idea of industrialisation. The fact that later service researchers have identified it as one of the mainstreams in the analysis of the goods-services relationship (Coombs & Miles, 2000; Gallouj, 2002) shows its significance. Also in later years, industrial processes have maintained their position as an ideal for efficiency. Part of the suggestions for the standardisation of services also continues this line of thinking (e.g. Northcraft & Chase, 1985). However, standardisation has a more neutral interpretation, too – this will be discussed in more detail in the analysis of the concepts near to productization.

2. The debate related to service models and systematic development processes. A significant part of newer research focusing on the systematisation of services has been carried out within the New Service Development (NSD) tradition in the 1990s. Some NSD researchers have focused on the development process of services; others have concentrated on modelling the outcome in order to facilitate its systematic development. Part of the first-mentioned studies highlights the significance of a formal development process with clear pre-planned stages as a prerequisite for a successful service (e.g. Cooper & Edgett, 1996). These studies have actually transferred the linear model of New Product

Development (NPD) to the field of services. The Nordic School of service marketing has developed process models that are more flexible and customer-oriented. A particular contribution in these studies is the modelling of the outcome as a means to support its systematic development (Edvardsson, 1997; see also Edvardsson & Olsson, 1996). These models are presented in more detail in the sub-chapter 2.3.2., where the NSD theories are presented.

3. The debate related to concept development and process description. More focused service studies have also tackled the issues of productization. Some researchers argue that conceptualisation or concept development is at the heart of service design. The service concept refers to a mental picture, “service in the mind” (Clark et al., 2000); it describes the customer’s and the provider’s expectations of what a service should be. According to the proponents of this view, an explicitly formulated service concept acts as an integrative element between the organisation’s business strategy and the delivery of its services. Other researchers have focused on the service process. They have first and foremost strived to solve the problems that emerge from the central role of customers such as the acquisition of relevant information of customer needs, and the decision to include/not to include customers in the actual service process. Service blueprinting (Shostack, 1982; Kingman-Brundage, 1995; Bitner et al., 2008) is one method that can be used to visualise service processes: to clarify the roles and responsibilities as well as the interaction between the customer and the service provider. Service blueprinting is discussed in more detail in the sub-chapter 2.3.1.

The impacts of the idea of industrialisation are difficult to evaluate at a detailed level because it does not include managerial advice for the development of services. The approaches of NSD, conceptualisation and blueprinting are much nearer to productization. Actually, the Nordic School version of NSD provides a good starting point for the specification of the core of productization. It just requires opening up the activities in both the customer encounter and in the intra-organisational knowledge sharing and collaboration.

2.2.2 The concept of service productization and its neighbouring concepts

As mentioned in the introduction, there are several concepts in the academic literature on services that refer to the systematisation tendency. In order to specify the concept of productization, it is important to compare it to its neighbouring concepts: industrialisation, standardisation, commodification, tangibilisation, codification, and modularisation. The concept of systematisation is not discussed separately, because it can be regarded as a general concept covering the others.

The concept of *industrialisation* was adopted by authors, who argued that services can be developed in the same way as manufacturing, including Tayloristic personnel management, standard products, and price competition based on

efficiency and productivity increase (cf. Sundbo, 2002). It was also suggested that services should move towards mass production (Levitt, 1972). After the 1970s, the use of the concept became rare. However, the basic ideas included have been presented every now and then also in the later years (Toivonen, 2015). As industrialisation favours standardised services and idealises assembly line -type efficiency, it neglects co-production. It does not take into account the difference between professional and routine services either. Thus, it is possible to conclude that industrialisation is critically different from the viewpoints of productization.

Also *standardisation* aims to reduce variety and create efficiency in the production of services. However, standardisation is used both in the strict meaning, which is almost identical with industrialisation (cf. Sundbo, 2002), and more broadly referring to any kind of systematisation (Cabigiosu et al., 2015; Miozzo & Grimshaw, 2005). Impacts on innovativeness has been one central topic in the discussion on standardisation. On the one hand, the role of standards and standardisation can be seen as representations of organisational control and regulation that impede innovation. Excessive standardisation of the service process can affect negatively on creativity and flexibility (Lievens & Moenaert, 2000). On the other hand, standardisation may also supports innovation by providing a structure through which to capture, exploit or implement existing knowledge (Wright et al., 2012).

Productization is closely related to the “loosely interpreted” standardisation. However, it should be emphasised that complete standardisation is not the aim of productization. Rather, the question is about the development of the basic processes and structures that are then complemented with case-specific elements. Some degree of flexibility is needed in order to respond to customer demands in each service encounter (Brax, 2013; Edvardsson, 1997; Sørensen et al., 2013).

The term “*commodification*” was first adopted by authors, who analysed the transformation of management knowledge into marketable services (Coombs & Miles, 2000; Heusinkveld & Benders, 2005; Suddaby & Greenwood, 2001). The authors used this term to refer to marketability requirements: the clarification of the nature of a service as a commercially valuable commodity. Close to commodification is the concept of *tangibilisation*. Reddy et al. (1993) speak about tangibilising, which in their approach means concretising the image of the service firm, and adding tangible elements to the offering. Both commodification and tangibilisation can be seen as a one aspect of productization. In comparison to these two practices, productization is a broader concept: its focus is not only on defining the service content through transforming company’s existing information and knowledge into more marketable form. Moreover, commodification and tangibilisation mainly systematise processes linked to service delivery, whereas productization also takes into account the internal processes of the company.

Codification is an essential part of knowledge management practices. Its objective is to standardise and replicate knowledge, behaviours and skills across the organisation – from knowledge of individual employees towards collective knowledge (Suddaby & Greenwood, 2001; Løwendahl et al., 2001; Morris & Empson, 1998). Thus, codification is an intra-organisational activity. It can be part of commodification, but knowledge can also be codified without becoming a commodity, and knowledge may be commodified without being codified (Ancori et al, 2000). Codification can be carried out in several ways, including manuals, databases, training courses and the use of standardised techniques of investigation. Codification presents the opportunity to systematise work tasks and delegate them to junior employees (Morris, 2001; Morris & Empson, 1998). However, not all knowledge is explicit and easy to be changed to transparent form. In every organisation there is much tacit knowledge, which resides in individual employees, and is difficult to express in words and in documented form. This kind of knowledge can be only developed and transferred through experiences and learning-by-doing (Nonaka, 1994). Codification can be seen as a close relative to productization: both highlight capturing, codifying and sharing best practices. However, productization is again a broader concept: it includes – not only the company’s internal exercise – but customer processes, too.

Modularisation refers to the practice in which a system can be divided into different parts or modules (e.g. Cabigiosu et al., 2015). The benefits of modularisation have long been recognised in manufacturing industries (Bask et al., 2010; Rajahonka, 2013; Voss & Hsuan, 2009). However, only recently scholars have started applying modularisation to services (Bask et al., 2010; Cabigiosu et al., 2015). Pekkarinen and Ulkuniemi (2008) have identified three dimensions in modularity: 1) modularity in services, 2) modularity in processes, and 3) modularity in organisation. They state that in order to use modularity in service development, each of these three dimensions need to be considered. Modularity in services refers to the possibility of combining different service elements to meet a client’s particular needs (Cabigiosu et al., 2015; Rahikka et al., 2011). Modular services are developed as stand-alone entities that can be mixed and matched (Voss & Hsuan 2009). Modularity in processes refers to standardised process steps that can be combined to produce the service as a whole. Bask et al. (2010, 368) define process modularity as “*the usage of reusable process steps that can be combined to accomplish flexibility and customisation for different customers or situations in service implementation*”. Modularity in organizations refers to the practice in which a company uses its own and other companies’ resources through internal or external organisational units to knowledge and information sharing with low coordination (Pekkarinen & Ulkuniemi, 2008). This form of modularity can be accomplished through various supplier network configurations or internal organisational structures (ibid.).

Sundbo (1994; 2002), who uses the form “*modulisation*”, recommends it as a way to combine customisation and standardisation in services: modules are fixed but their combinations are unique. Through the modulisation effort, an organisation can break the overall service into smaller, more standardised elements. These elements may then be combined in various ways to allow greater flexibility to answer customer requirements while still maintaining standardisation of the individual elements (ibid.). Modularisation also supports service innovation, as the codified and standardised service elements allow the organisation to quickly recombine new services (Gallouj & Weinstein, 1997).

It is possible to conclude that modularisation is an important concept from the viewpoint of productization. However, while modularisation focuses on the systematisation of the service content and the process, the creation of common intra-organisational understanding and common new practises to produce the service are less discussed. In service productization, they are however an essential counterpart to the appreciation of the customer perspective and the creation of value to the customer. Thus, modularisation can be seen as a narrower approach than productization, i.e. one part or phase in the productization activity.

In this dissertation, the concept of “productization” is used for several reasons. Firstly, as a newer concept it enables adopting fresh perspectives, such as innovation and learning. Secondly, it is more neutral than the manufacturing biased concepts of “industrialisation” and “standardisation”. Thirdly, service productization is a concept that is both theoretical and practical. Finally, productization provides a broader interpretation than the concepts of modification, tangibilisation, codification or modularisation.

2.2.3 Defining service productization

As mentioned in the introduction, service productization is commonly used without a definition (Jaakkola, 2011). It is more often found in practice-oriented than academic texts, and in these texts, it is typically described through its aims rather than contents (Cross & Paquette, 2014; Jaakkola et al., 2007; Sipilä, 1999; Werr & Stjernberg, 2003). However, there exist a few conceptual specifications and definitions in the academic literature, too. The first applications of the concept – in the form “productivisation” – appear in publications which analyse the transformation of management knowledge into marketable services (Heusinkveld & Benders, 2005; Huczynski, 1993). Here, productization refers to an activity, which makes the service offering more “product-like” through a systematisation of its components. A newer definition can be found in an article by Jaakkola (2011). She defines productization by identifying three key practices in it: 1) specifying and standardising the *service offering*, 2) tangibilising and concretising the service offering and *professional expertise*, and 3) systematising and standardising *processes and methods*.

The two-fold task of systematising both the service offering and the productization process is taken as the starting point in this dissertation, too. However, deviating from Jaakkola (2011), the concept of standardisation is not used to illustrate the idea because it does not allow emphasising the connection between productization and innovation, which is one of the central arguments in this dissertation. Further, the systematisation of professional expertise is not seen as a separate task but the offering is considered to reflect the implementation of expertise. In this implementation, not only the expertise of individuals is important but the shared understanding between employees plays a crucial role. Based on these views, productization is preliminarily defined as follows: “*Productization is a service development approach that through systematising and concretising both the service content and the service process aims to create common understanding and to produce the offering in a systematic way.*” This definition will be further elaborated in chapter 5.1. based on the deeper literature analysis and the empirical findings of this dissertation.

2.3 Key literature streams linked to productization

The systematic development of services has been studied using different concepts and approaches. Even though the concept of productization has been used rarely, the aim and the basic idea included can be identified in several concepts, as discussed in sub-chapter 2.2.2. In the present sub-chapter, productization is analysed in relation to four traditions of service research: service marketing, New Service Development (NSD), service engineering, and service innovation. All of these literature streams have contributed to the systematic development of services, and are thus relevant for this dissertation. They can be seen as the key literature streams related to service productization.

2.3.1 Service marketing

In 1980s, when the service industries started to have significant impact, the “service/services marketing”, a sub-discipline of marketing, emerged. The early empirical investigations aimed at developing reliable and valid measures of service management. Already during these initial phases, the influential research of service marketing was conducted in the USA and Nordic countries. While research from both sources addressed service quality and customer loyalty, it led to two different research traditions (Baron et al., 2014). In the USA, quantitative research with positivistic underpinnings and a priori hypotheses (Kowalkowski, 2015) was emphasized, and the *services marketing* discipline was developed (Fisk et al., 1993). In the Nordic tradition, case study approaches were adopted, leading the development of *Service Marketing and Management* – also known as the Nordic School of Service Marketing. The Nordic School is relationship and customer focused, and has its foundations in customer behaviour, social psychology, and consumer behaviour literature (Helkula, 2010).

Research into service marketing and management developed in a direction, which strongly highlights the interactive nature of services. The concept of the service encounter became central and brought to the fore the importance of personal input by service providers and customers (Brax, 2013; Edvardsson, 1997; Tuunanen & Cassab, 2011). Service quality models, which were actively built, highlighted the notion, that quality is determined by customers (Edvardsson, 1997; Grönroos, 1984, 2006, 2008). Despite the emphasis on the customer role and the uniqueness of service interaction, the need for systematisation of services has also been recognised within the marketing school.

In recent years, the framework of service-dominant logic (S-D logic) developed by Vargo and Lusch (2004, 2008) has gained popularity. Its starting point is in service marketing but it criticises the extra emphasis laid on individual services. Instead of services, S-D logic puts forth the concept of service (singular) – defined as the application of knowledge and skills, and seen as the fundamental unit of exchange in markets (also in the markets of manufactured goods). The central argument by Vargo and Lusch is that value is always co-created by the provider and the beneficiary (ibid.). The use context of goods and services is an essential arena for value creation: a single good or service is combined with other goods and services that the customer acquires from different providers. Since 2004, the development of service marketing has been especially active within S-D logic (Helkkula, 2010; Kowalkowski, 2015). Currently, service marketing and S-D logic overlap with each other: both are under active debate and development (Edvardsson et al., 2008). Whilst “industrialisationists” argued that manufacturing logic should be applied to services, the S-D logic requires that the service perspective should be applied to manufacturing (Vargo & Lusch, 2008; Miles, 2016).

Within the American tradition, one of the most important contributions has been the development of service blueprinting. This approach can be used to describe and systematise the service process as a part of productization.

Service blueprinting

The *service blueprinting* approach was originally introduced by Shostack (1982). It is a hybrid between a theory of the process and a technique to model and design service processes (Brax, 2013). It can be used as an analytical frame in investigating the flows of service processes.

Blueprinting was further developed by Kingman-Brundage et al. (1995) to visualise and clarify the roles and responsibilities of and the interaction between the customer and the service provider. A blueprint is a two-dimensional picture of a service process: The horizontal axis represents a chronology of actions conducted by the customer and the provider. The vertical axis distinguishes between different areas of actions. In their present form, blueprints usually include the following types of action areas: customer actions, actions of front-office staff, actions of back office staff, support processes, and manage-

ment processes. These different actions are separated by “lines”: a line of interaction, a line of visibility, a line of internal interaction and a line of implementation. Also the physical evidence of the service (documents etc.) can be included in a blueprint. (Bitner et al., 2008; Fliess & Kleinaltenkamp, 2004)

Service blueprinting has been criticised of being too narrow. However, it is an efficient way of systematising and describing service process and can be seen as a way to innovate (Bitner et al., 2008).

2.3.2 New Service Development

Since the beginning of the 1990s, New Service Development (NSD) has been an active stream of research regarding the systematisation of services. It has roots in New Product Development (NPD), which understands development activities as a formal and planned process (Toivonen et al., 2007). NSD has been often combined with studies in the framework of service marketing. Especially, the Nordic School of Service Marketing has influenced NSD (Helkkula, 2010).

Several models for more planned and directed service development processes have been presented. These models correspond to intentional innovations, the “R&D model”, which involves processes that are initiated and developed by organizations’ management, marketing and/or R&D departments. The studies highlight the significance of a formal process with clear pre-planned stages as a prerequisite for a successful service (de Brentani, 1991; Cooper & Edgett, 1996). The number and categorisation of the stages vary in different studies, but essentially they include idea generation, development, piloting and commercialisation. For example, Johnson et al. (2000), put forth a model with four phases: design, analysis, development, and full launch. The model suggested by Stevens and Dimitriadis (2005) consists of 16 overlapping steps divided into three main stages: informal development, formal development and implementation. A common feature in these models is that they end with an implementation phase, where the developed service is put into use in service operations. The growing emphasis on customer orientation as a source of sustainable competitive advantage (Kim & Mauborgne, 1999) is also visible in newer models: input from customers has been added as an element to different stages of the development process (Alam & Perry, 2002).

NSD has often been seen as almost synonymous with service innovation (Goldstein et al. 2002; see also Witell et al., 2016), which means that the target of development is a totally new service or an essentially redesigned existing service. This kind of requirement is not included in the idea of productization, even though it is possible that a careful analysis of a service leads to a perception of opportunities for renewal, even to innovation.

The “Edvardssonian model” for service development

While some NSD models have a close relationship to NPD (e.g. Cooper & Edgett, 1996), the Nordic School of Service Marketing has developed more service specific models. The model of Edvardsson and Olsson (1996; see also Edvardsson, 1997) is a particularly important example of these kinds of models. It focuses on the customer perspective in service development. The “Edvardssonian model” has been a source of inspiration for many other service development models, and it is the starting point for the customer-oriented service productization model of this dissertation, too.

A great benefit of the Edvardssonian model is that it provides a reasonable description of how to combine the uniqueness of individual service acts with a productized pre-planned service. According to it, each individual service consists of both a customer-perceived outcome and a customer-unique process. The service company cannot do the actual service provision without the customer. It can, however, develop the best and right prerequisites for well-functioning customer processes and attractive customer outcomes. These prerequisites include three components: the service concept, the service process and the service system.

In the Edvardssonian model, the three components – concept, process and system – are all seen as equally important from the viewpoint of service development. The service concept refers to the description of the customer’s needs and how they are to be satisfied. The content and structure of the service are specified here, including the specification of the core service and supporting services. The service process is the prototype for every customer process and describes the chain of activities that must function properly when the service is actually produced. The service system constitutes the resources that are required by the service process in order to realise the service concept. It includes sub-components like the service company’s staff, the physical/technical environment, and the organisational structure. The concept of service system highlights the importance of systematic development, not only in those service elements that are visible to the customer, but also regarding the service company’s internal processes.

Corresponding to the components, the development process of a service includes three sub-processes: service concept development, service system development and service process development. Regarding each sub-process, Edvardsson specifies several more detailed tasks. For instance, the concept development involves – in addition to the analysis of customers’ needs, and the content and structure of the service – the following tasks: analysis of target markets; a cost, income and price analysis; analysis of the fit of the service into the general service assortment of the firm; analysis of competitors; and analysis of institutional preconditions, such as legal demands.

2.3.3 Service engineering

Service engineering was developed in the mid-nineties in Germany and Israel as an answer to the need of a technically oriented discipline dealing with the systematic development of services. In contrast to highly customer-oriented New Service Development (NSD), service engineering assumes that services can be designed and developed using the intra-organisational approaches applied in the design of physical products. In other words, services are seen as an object of research and development (R&D) (Fährnich & Meiren, 2007).

Service engineering can be understood as “*a technical discipline concerned with the systematic development and design of services using suitable models, methods and tools*” (Bullinger et al., 2003, 276). The goal is to develop scientifically-based design principles and tools that often use some software. According to Bullinger et al. (2003), a service can be characterised by three different dimensions, which should be taken into account during the development: The *structure dimension* determines the ability and willingness to deliver the service. The *process dimension* refers to the external factors (persons, goods, rights and information) that the service is performed on or that are integrated in the provision processes of the service. The *outcome dimension* indicates the outcome of the service and shows certain material and immaterial impacts for the external factors. (ibid.)

The model for developing services is divided into six main phases: idea generation, requirements analysis, concept development, implementation, market launch and post-launch review (Bullinger et al., 2003). These phases are very close to the phases of traditional product development (Saren, 1984). On the other hand, the representatives of service engineering show a critical stance towards a too straightforward application of traditional product development in services. As noted by Fährnich and Meiren (2007), these kinds of attempts are likely to fail in services like KIBS, which entail a high degree of intangibility and need a close interaction between customers and employees.

Despite a certain antagonism between the starting points of engineering approaches and marketing approaches, the practical applications do not radically differ. Both the three dimensions and the service development process suggested by Bullinger et al. (2003) have a close resemblance with the Edvardssonian model (1997) and other models developed within the tradition of New Service Development (NSD). The different service research traditions have been inspiring each other while also attempting to highlight their own specificities. Service engineering emphasises the importance of intra-organisational development and is more technically oriented compared to the other traditions discussed above. As an efficient way of systematising service and service development process, it supports service productization and its aims, but needs supplementation as regards the organisation of co-production with customers and clients.

2.3.4 Service innovation

Service innovation refers to the introduction of an idea about a completely new or improved commercialised service to a firm's offering (Carlborg et al., 2014; Gallouj & Savona, 2009). A deliberately and systematically repeated and implemented activity, with economically significant outcomes, is a characteristic of innovation (Gallouj, 2002). In other words, service innovations are novelties that are carried into practice, provide benefit to their developer, and are replicable (Sørensen et al., 2013; Toivonen & Tuominen, 2009).

Various kinds of processes have been detected and several models and categorisations have been suggested for service innovation (Gallouj & Weinstein, 1997; den Hertog, 2000; Stevens & Dimitriadis, 2005). Due to the nature of services, and differences in organizational characteristics, service innovation cannot be fully understood in terms of pre-planning models based on scientifically-driven R&D (Droege et al., 2009; de Jong & Vermeulen, 2003; Menor et al., 2002). Service innovation and development activities are not encapsulated within a separate R&D unit but spread throughout the organisation and are typically iterative in nature (Sundbo, 1996).

Service innovations often result from a bottom-up process where employees act as corporate entrepreneurs (Leiponen, 2005; Sundbo, 1997; Sørensen et al., 2013; Toivonen & Tuominen, 2009). In many cases, they emerge in the process of service provision on the basis of clients' needs, and are recognised as innovations afterwards. After the recognition of the innovation, the further development may be done more systematically (Sørensen et al., 2013; Toivonen & Tuominen, 2009). Gallouj and Weinstein (1997) call this process "a posteriori innovation". This innovation type is typical in KIBS companies. Toivonen and Tuominen (2009) separate three process types that lead to innovation in KIBS. The first type is a modification of the "R&D model", where specific resources are allocated to the development of an innovation. These processes are planned and well-structured top-down processes that are initiated and developed by organisations' management. The second type is "rapid application", where an idea is brought to the market and, if judged to be promising enough, is then further developed. The third type is "practice-driven model": the service is developed step by step together with the customer and the innovation is recognised only afterwards (see also Sørensen et al., 2013; Witell et al., 2016).

The basic views on service innovation are very relevant from the viewpoint of productization, too. In the conceptual sense, closest to productization is the concept of *formalisation innovation*. It is part of the innovation model developed by Gallouj and Weinstein (1997), which analyses services as a compilation of technical, competence, and final characteristics. Technical characteristics include all tangible and intangible systems used in the production of services (also the process). Competence characteristics refer to the composition of

skills of the provider and the customer. Final characteristics describe the benefits for users.

Gallouj and Weinstein (1997) define innovation as any change affecting one or more characteristics. They identify six types of innovations: improvement innovation, innovation by addition or substitution, recombination innovation, formalisation innovation, radical innovation, and ad hoc innovation. Improvement innovation means the increase in the value of a certain final characteristic by the enhancement of a technical or competence characteristic. Innovation by addition or substitution occurs when one or more new elements is added to or replaced in technical characteristics, causing a change in competences and final characteristics. Recombination innovation refers to services, which are developed either by combining characteristics of existing services or by dividing up these services. Formalisation innovation occurs when a service is improved by clarifying the relationships between technical and final characteristics. Radical innovation refers to a completely new service – a change in all of its characteristics. Finally, ad hoc innovation refers to a tailor-made solution. Even though the solution as such cannot be transferred to new situation, the expertise developed is reproducible. (Gallouj & Weinstein, 1997; Gallouj, 2002)

2.4 Productization of KIBS offerings

The “discovery” of KIBS – a service sector which is high skilled and has close linkages to the innovation infrastructure of the contemporary economies (den Hertog & Bilderbeek, 2000) – has had an important influence on the research on services. It has changed the view about services as laggards in the economic development. During the last twenty years, KIBS have been one of the most actively studied sectors in services (Miles, 2005). Studies focusing on the topic of productization in KIBS are scarce, but it is possible to collect findings from sources that are indirectly linked to productization. The following analysis starts from the nature of KIBS offerings and professional work, on which the innovation literature and knowledge management literature provide relevant insights. Thereafter, the aims and challenges that characterise productization in KIBS are discussed on the basis of various literature sources.

2.4.1 The nature of KIBS offerings

The content of KIBS offerings is knowledge. This raises the question of how KIBS companies upkeep and renew their knowledge base in the interaction with clients and in their internal processes. Gallouj (2002) has suggested a knowledge processing framework consisting of three elements: the source (S), the receiver (R) and the processor (P). Both KIBS companies and their clients can play any of these roles. The client company not only acts as the recipient of the service, but it is a knowledge processor in the co-production of services. Furthermore, some knowledge concerning the client itself is needed, i.e. the client also functions as a source of knowledge. Correspondingly, the service

provider is not only the processor of the knowledge, but also a receiver: it seeks to store the knowledge that emerges in the client interactions in its organisational memory in order to use it later as input knowledge. A KIBS company as a knowledge source refers to the database accumulated in repeated service transactions. In addition to the client and the service provider, the external environment functions as an important source of knowledge. Figure 1 illustrates Gallouj's (2002, 265) framework on the elements of knowledge processing in KIBS companies.

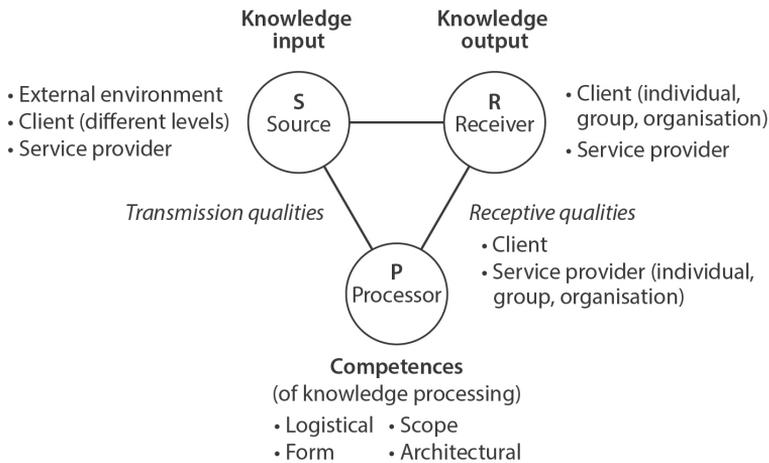


Figure 1. Knowledge processing in KIBS companies (Gallouj 2002, 265)

The qualities of the receiver and the source, as well as the competences of the processor, are important for a successful service. The receptive qualities are essential for the receiver. They are synonymous with the concept of absorptive capacity (Cohen & Levinthal, 1990) and include cognitive aptitudes, technical conditions and attitudes encouraging the acquisition of knowledge. For the source, transmission qualities that denote the propensity to deliver up knowledge are important. Many factors may strengthen or weaken these qualities. Receptive qualities are weakened, among others, by the lack of experts in a given function within the client organisation. Transmission qualities are generally increased when the knowledge is codified, whereas they decline when the knowledge is regarded as strategic by the source or when the activity of the source is questioned. Both receptive and transmission qualities are to some extent given, but they can also be improved. “Know-where” type of knowledge provided by KIBS companies is an example of a situation in which service intervention can improve transmission qualities.

Among the competences of the knowledge processor, the first is the logistical competence, linked to the linear transfer of knowledge (which is in this case actually reduced to information). In KIBS companies, the logistical competence is usually combined with other competences. Form competences de-

scribe the capacity to transform knowledge that is tacit at the source into knowledge that is codified at the receiver's end and vice versa. Through the former process, KIBS companies help their clients become aware of knowledge that they may possess but have ignored. In the latter case, the provider has a pedagogical function; it supports the client during the learning process (cf. the knowledge cycle by Nonaka & Takeuchi, 1995). Scope competences, too, change the form of knowledge: from specific to general and vice versa. Finally, architectural competences refer to the association and dissociation of knowledge: supplying the receiver with a combination of discrete items of knowledge or separating out a set of knowledge in order to produce a different set of knowledge.

Gallouj's framework formalises many functions that are essential in knowledge-based co-production of services. It also points out several ways to "productize knowledge". Actually, both form and scope competences as well as architectural competences are needed in the development of productized service offerings. Receptive and transmission qualities, on the other hand, are important prerequisites for the success of the co-production process in which the service is delivered to the client. Transmission qualities are also crucial in the intra-firm collaboration: willingness to give up own knowledge to colleagues is not self-evident as was mentioned in the introduction; this issue will be discussed in more detail later in this chapter.

Strambach's (2008) analysis supplements the framework of Gallouj. She identifies three types of knowledge bases – analytic, synthetic and symbolic – and suggests that most typical in KIBS companies is synthetic knowledge base, which applies and combines existing knowledge. Technical and management consultancies, as well as IT companies, usually rely on it. An analytical knowledge base is found mainly in R&D services; it is linked to science-based innovation and includes codification, formal models and rational search processes. Marketing and advertising represent KIBS sectors that are dependent on symbolic knowledge dealing with ideas and socially constructed commodities.

Strambach also identifies different knowledge domains and knowledge processing practices in KIBS companies at a general level. She divides the knowledge domains to horizontal and vertical, the former representing business functions (production, marketing, financial analyses, human resource management etc.) and the latter sector-specific knowledge. Knowledge processing practices are considered as interplay between contextualisation and de-contextualisation. Contextualisation refers to the processing of knowledge in a given service relationship, whereas de-contextualisation unleashes the accumulated knowledge from its specific application. De-contextualisation can be regarded as the core mechanism in productization. According to Strambach (2008), there has been little exploration of the de-contextualisation process in KIBS research.

2.4.2 Aims and challenges in the productization KIBS offerings

KIBS offerings have traditionally been highly customised. Unique situations where solutions are based on the specific context and needs of the customer have been typical. Improvement of *efficiency* is usually mentioned as the main aim of productization in KIBS, as well as in other service companies (Heu-sinkveld & Benders, 2005; Suddaby & Greenwood, 2001). However, also the quality issues push KIBS companies to diminish the variety that is linked to fully tailor-made services (Jaakkola, 2011). These issues are linked to the achievement of *effectiveness* – the other aspect of productivity. In the following, these two sides of the coin are discussed in terms of the implementation of productization.

Productization increases the efficiency of service operations through shared models and elements, which enable the repeatability and scalability of the service. The production of a carefully defined and designed service is less time consuming, and the increased concreteness makes the service easier to market (Edvardsson, 1997) and differentiate from competitors' offerings (Bitner et al., 2008). Common tools, visible processes, and clearly defined roles, responsibilities and work tasks can be used to achieve this aim (Løwendahl et al., 2001; Morris & Empson, 1998). An important organisation-wide task is to commonly determine the purposeful level to which the customer-specific variation is reduced. In addition to the efficiency gained via this reduction, productization indirectly increases efficiency by improving the KIBS company's capacity to learn. If services are not productized, the experience gained in customer encounters is not accumulated. Productization helps eliminate intuitiveness and randomness and the loss of lessons learned (Toivonen, 2015).

Quality has been a central concern in service research since its early days (Grönroos, 1984). The concern is based on the observations that there are remarkable gaps between customers' expectations and reality (Baron et al., 2014; Fisk et al., 1993). Productization supports the achievement of uniform quality, which is often difficult to achieve due to the varying customer needs and the varying skills, experience and attitudes of service personnel. Based on a jointly agreed operating model, the organisation can diminish the dependence of the quality on the individual employee. Productization also opens up the contents of the service to the customers, and thus diminishes insecurity linked to the fact that in services, customers always have to make purchase decisions based on promises (Edvardsson, 1997). In KIBS companies, whose business relies on expert knowledge, attention to the stability of the service quality is particularly important (Wright et al., 2012). On the other hand, it is important to take into account that many KIBS offerings are strategically important to customers, and productization must not trivialise customer problems (Morris & Empson, 1998).

There are several reasons that make productization particularly challenging in KIBS companies because of the specific characteristics of KIBS. Three chal-

lenges are pointed out in the following: 1) understanding and organising the co-production relationship which is deeper in KIBS than in many other services, 2) reconciling the controversy between shared understanding and professional autonomy, and 3) fostering innovativeness in the context of productization.

The interaction between a KIBS company and its customer is a multidimensional and challenging process (Gallouj & Toivonen, 2011). In the application of expertise, the core is the integration of generic knowledge with the customer enterprise's everyday knowledge (Antonelli, 1999) and ensuring that both parties understand matters in the same way. An additional challenge is the varying scope of the expert tasks: the service contents may vary from the development of an individual solution to the implementation of major changes in the customer's organisation and business model. The KIBS company has – not only to understand the goals of the customer's business and the value chain or network in which the customer operates – but it is also responsible for navigating and driving the customer process towards the goals set (Toivonen, 2004).

An internal challenge in KIBS companies is streamlining the knowledge creation and knowledge management practices with the increasing customer orientation. There is pressure to develop common knowledge bases and efficient knowledge sharing platforms in order to improve the capability of serving the customers. On the other hand, the background of many KIBS companies is in professional services whose delivery has typically relied on individual employees' competence and autonomy (Greenwood et al., 1990; Hinings et al., 1991). Knowledge has been an important source of power and prestige, which raises the issue of how to motivate employees to participate in activities that diminish their autonomy (von Nordenflycht, 2010). The on-going development is more or less contradictory to the earlier practices of professionals and forces them to make sense of the change in relation to their identity (Jacobs et al. 2013; Wasserman & Frenkel, 2011).

The central role of innovation activities cannot be ignored in KIBS companies. Innovativeness is a prerequisite for the success of KIBS business: in order to be competitive, these companies have to continuously update their knowledge base (den Hertog, 2000; Gallouj, 2002). Thus, it is plausible to argue that productization must be in line and integrated with innovation. This means accepting the challenge that continuous change goes hand in hand with the efforts to create structure in offerings and processes. A facilitating point is the fact that innovation and productization have common features: both processes aim to generalise on the basis of problem-specific insights that the repeated interactions with clients produce. This requires systematic identification and development of scalable elements – the more widely applicable cognitive inputs behind unique solutions (Preissl, 2000; Sundbo & Gallouj, 2000). Some form of productization always takes place during service innovation, as it is necessary to find words and concepts for new ideas, beliefs and other intellec-

tual schemes before organisation-wide implementation (Menor et al., 2002; Stevens & Dimitriadis, 2005). Productization creates common language that supports the production as well as further development of the service (Wright et al., 2012). Thus, as its best, productization can provide a learning platform that enables the acquisition, sharing, and systematisation of customer understanding within the organisation.

The above-described challenges manifest themselves differently in different types of KIBS companies. In traditional professional firms, the existing knowledge is usually transferred effectively, but innovations may be neglected (Morris & Empson, 1998). Innovative orientation is closely linked with an entrepreneurial attitude, which is characteristic of new KIBS companies but unfamiliar in many established companies (Alvesson, 2004). Another difference can be found between big and small KIBS companies. The challenge of productization is often highlighted in the latter: the resources are too small to carry out this activity. As a result, fully tailor-made offerings are a typical practice and weaken the ability to achieve productivity (Caru & Toivonen, 2016).

2.5 Summary of the literature review

Service productization is an emerging concept. However, the literature review above shows that the idea has been actively discussed for decades. In the background of this discussion is the immaterial and process nature of services, which does not allow the production of offerings in identical pieces like assembly line in manufacturing. This perception raised concerns about the productivity of services and these concerns have every now and then re-appeared until today. In the early stages of the discussion, the differences between goods and services were highlighted and the manufacturing processes were set as an ideal that could also push the development of services forward (the assimilation view – Coombs & Miles, 2000; Miles, 2016). As a counter reaction, the peculiarities of services were pointed out and separate models were suggested to the analysis of goods and services (the demarcation view – *ibid.*). The most recent discussion favours integrative views: to a certain extent, the same basic models are applicable in both goods and services (the synthesis view – *ibid.*). The product nature of services should be made more visible to facilitate the provision and purchase of services. This is the starting point for the development and application of productization.

Three phases can be identified in the debate, which has concerned service productization. These phases show a tendency of moving from more general economic issues to more specific managerial issues. The debate started in the 1970s and 1980s from the argumentation that regarded “industrialisation” as an ideal, which also services development should follow (Levitt, 1972). This normative view raised manufacturing processes to a position of best practices that secure efficiency and productivity. The view developed hand in hand with the above-mentioned assimilation approach. Its impact was, however, dimin-

ished by the fact that there were very few suggestions about the practical implementation of industrialisation. An important step forward was taken when the representatives of the school of service marketing and management started to develop concrete models of new service development. The model by Edvardsson (1997) is particularly important because it shows how the unique service experience of the customer can be combined with central service elements that the provider can and should plan before the delivery (concept, process and system). The third phase has included even more focused managerial approaches. Concept development has been emphasised as the core of service design and ways to create a successful service concept have been elaborated (Clark et al., 2000). On the other hand, the “customer path” has aroused increasing interest and stimulated the re-use of the old practice of process blue-printing (Shostack, 1982; Bitner et al., 2008).

There are several concepts in the academic literature that refer to the systematic development of services. In the review above, the concept of productization was compared to the concepts of industrialisation, standardisation, commodification, codification, tangibilisation and modularisation. Based on the short historical summary on the productization debate, it became clear that industrialisation is not pursued – the view that service development should imitate manufacturing development does not capture the essence of service: co-production with customers. The relation to the concept of standardisation is more complicated because standardisation is used in both the strict meaning (almost the same as industrialisation) (Bowen & Youngdahl, 1998; cf. Sundbo, 2002) and more loosely referring to any kind of systematisation (Cabigiosu et al., 2015; Miozzo & Grimshaw, 2005). When the latter interpretation is used, productization may actually come very close to standardisation. The concept of “commodification” refers specifically to the nature of service as a marketable commodity (e.g. Coombs & Miles, 2000; Heusinkveld & Benders, 2005). Compared to productization, it is a narrower concept which does not include the ideas of co-production and shared understanding in the provider organisation. The concept of “codification” refers to a specific task in the process of productization: tacit knowledge typical of services (e.g. Suddaby & Greenwood, 2001; Løwendahl et al., 2001) has to be converted into explicit knowledge before the service can be made visible to customers and before different employees can accumulate common understanding on it. The concept of “tangibilisation” includes to the concretising of the service offering through adding tangible elements to it (e.g. Reddy et al., 1993). The concept of “modularisation” can be interpreted to depict a specific way to carry out productization: compiling a service of fixed elements that enable various combinations according to customer needs. Codification, tangibilisation and modularisation are well in line with the idea of productization and can be used as partial solutions within a productization process.

A preliminary definition for productization was formulated in the end of conceptual discussion. The few definitions found in literature were used as the

basis, but an own definition was considered necessary in order to highlight the linkage to innovation (and the correspondent separation from standardisation) and the necessity of shared understanding. The preliminary definition, to be further developed in the discussion part of the dissertation, was formulated as follows: “*Service productization is a service development approach that through systematising and concretising both the service content and service process aims to create common understanding and to produce the service in a systematic way.*”

After the conceptual discussion, a theoretical background for productization was sought in the key streams of service research: service marketing, New Service Development (NSD), service engineering and service innovation. Aims to answer the need for systematisation of services were identified in all these traditions. Service marketing highlights the customer experience. Its particular contribution from the viewpoint of productization is the focus on “the customer path”. The method of service blueprinting makes visible the activities of both the provider and the customer during the service process (Bitner et al. 2008). New Service Development (NSD) is based on marketing thinking and concentrates on clarifying the tasks during the adoption of a new service. Some NSD models rely heavily on R&D applied in manufacturing, but others – particularly the Nordic School of Service Marketing – have developed service specific NSD models. The model of Edvardsson (1997) suggests a way combine the unique service experience with systematic pre-planning. Service engineering highlights the systematic development and design of services; the goal is to develop scientifically-based design principles and tools that often use some software. The stages of development are usually similar to NSD. Service innovation research has brought to the fore also more flexible development possibilities: rapid application and practice-driven models. The concept of formalisation innovation (Gallouj & Weinstein, 1997) comes close to the idea of productization. It points out that innovation does not only mean adding something new but also the clarification of the relationship between the service elements and the customer benefit can be sometimes considered an innovation. Table 2 summarises the conceptual and theoretical discussion. It depicts the core contents of the neighbouring concepts and the central theories linked to productization.

Table 2. Neighbouring concepts and central theories linked to productization

Neighbouring concepts	Key literature streams
Industrialisation: Manufacturing as an ideal for service development.	Service marketing: Addressing service quality, customer loyalty and customer experience
Standardisation: 1) mass production of services, 2) systematisation of services	<ul style="list-style-type: none"> • Nordic School • American School: service blueprinting
Commodification: Highlighting the marketability of services.	New Service Development (NSD): Clarifying the tasks during the adoption of the new service
Codification: Converting tacit knowledge to explicit knowledge.	<ul style="list-style-type: none"> • The “Edvardssonian model”
Tangibilisation: Concretising the service through adding tangible elements.	Service engineering: The systematic development and design of services.
Modularisation: Compiling a unique offering of fixed “pieces”.	Service innovation: The processes of innovation and productization may go hand in hand; The concept of formalisation innovation.

The literature review also includes the theories and studies on KIBS – the empirical context of this dissertation. The review has opened up the nature of KIBS offerings, pointing out the different types of knowledge processing practices and the different capabilities and competences needed in knowledge creation, transmission and reception. Thereafter, productization is considered from the viewpoints of efficiency and effectiveness. Finally, the specific challenges of productization in KIBS have been analysed. Three main issues have been identified: understanding and organising the co-production relationship which is deep in KIBS, reconciling the controversy between shared understanding and professional autonomy, and fostering innovativeness in the context of productization. The review shows that limited research exists on how KIBS companies can overcome these challenges (Leiponen, 2005; Miozzo & Grimshaw, 2005), which motivates the studies carried out in this dissertation.

3. Methodology

As productization of knowledge-intensive business services is an emerging research topic it lacks a coherent vocabulary and concepts, and there is only scant theorising about the phenomenon. This indicates that qualitative theory-building approaches are suitable for studying this phenomenon. In this dissertation, the case study approach has been selected because it makes possible to address “how” and “why” type research questions (Edmondson & McManus, 2007) that are tightly linked to the managerial issues involved (Piekkari & Welch, 2011).

The methodological chapter in hand starts by presenting the case study approach and how it has been applied in the different studies included in this dissertation. The case companies and the data collection and analysis are then described. The chapter ends with evaluating the trustworthiness of the whole research.

3.1 Research approach

3.1.1 Case study approach and its application in this dissertation

Case research has its roots in the broader field of social sciences, in particular in ethnographic studies and anthropology from where it has spread to managerial and many other disciplines (Voss et al., 2002). Case studies are particularly suitable for studying phenomena that are not yet well-known. The approach favours a rich and deep understanding of the dynamics of certain phenomena in a certain context (Yin, 1994). The very strength of the case study approach lies in its diversity and flexibility: it is responsive to different questions, divergent philosophical assumptions and to variations in context (Piekkari & Welch, 2011). Evidence for case studies may come from many sources: interviews, participant observation, non-participant observation, documents, archival records and physical artefacts.

In the following I describe the most important solutions that I have made regarding the type of the case studies applied in the three empirical articles I, II and III; article IV is a conceptual article. In particular, I present the relationship of my case studies to theory development, take into account the different

possibilities regarding the number of cases and the length of follow-up, and position my case studies between disciplinary traditions.

Case research can be used for different types research purposes: theory generation, theory testing and theory elaboration (e.g. Darke et al., 1998; Ketokivi & Choi, 2014; Voss et al., 2002). These three approaches are based on different logics, and each of them presents one possible way of thinking about the interplay between theory, empirical data, and the context:

- *Case research as theory generation*, also known as inductive case study (Eisenhardt, 1989), is the most familiar case research approach (Voss et al, 2002). The premise in this approach is that whenever theory does not exist, it is generated using empirical analysis, exploration. In this approach, theoretical propositions can be generated and subjected to testing (Eisenhardt, 1989). The case studies presented in article II utilise this approach attempting to generate new theory and theoretical propositions.
- *Case research as theory testing* is rarely used in case research. In this approach the data is approached with a more priori theoretical assumptions. The driving force is deduction: hypotheses are derived from a priori selected underlying theory (Ketokivi & Choi, 2014). This approach has not been used in the case studies presented in articles.
- In the *case research as theory elaboration*, a general theory has been identified that can be used to approach the empirical context. Theory elaboration focuses on the contextualised logic of a general theory. However, in this approach the formulation of a priori propositions are not formulated and the aim is not to test the theory but to elaborate it (Ketokivi & Choi, 2014). The case studies presented in articles I and III aim at theory elaboration. In these case studies, several theories have been identified and used to approach the data. The aim is to elaborate these theories as well as introduce and specify the concept of service productization.

Case study research may adopt single-case or multiple-case designs. A single case study is appropriate where it represents critical, extreme, unique case or revelatory case (Yin, 1994). Single cases provide for in-depth investigation and rich description. Multiple-case designs allow cross-case analysis and comparison, and the investigation of a particular phenomenon in diverse settings (Darke et al., 1998; Yin, 1994). The case studies in the empirical articles (articles I, II and III) are all multiple case studies. The number of cases is small, if compared to the (positivistic) recommendations of Eisenhardt (1989) and Yin (2003). Eisenhardt (1989) suggests that four to ten cases are desirable for theory building when using case study research. However, many researchers have reminded (e.g. Darke et al., 1998) that there is no ideal number of cases; the number of cases to be studied depends on the focus of the research question.

The cases in articles I and II can be categorised also as longitudinal case studies. Longitudinal studies extend beyond a single moment in time (Voss et al., 2002), and are suitable in research fields, which entail processual elements, evolutionary developments and dependencies that can be uncovered through long-term data (Blazejewski, 2011). The aim of article I was to study the benefits from productization both in short term and in the longer term. Thus, longitudinal case study approach was critical as the longer-term benefits were identifiable only via longer follow-up. In article II, in-depth longitudinal data was needed to provide detailed insight into the antecedents and dynamics of service productization processes. Furthermore, as service productization are typically long processes, it was necessary to study longitudinally how different factors emerge. The longitudinal characteristics – data collection and observation during several points of time – are strength in the cases presented in articles I and II. The two follow-up interview rounds in article I, are worth mentioning in particular. Several authors have called for more longitudinal case studies (Blazejewski, 2011; Piekkari et al., 2009; Voss et al., 2002).

3.1.2 Positioning the study between the diverse schools of case studies

Within the case study approach, diverse schools of thought can be identified. Case study research has been used both within the positivist and the interpretivist philosophical traditions (Darke et al., 1998; Piekkari et al., 2009). Within the positivist tradition, case study is designed and evaluated according to the criteria of the natural science: controlled observations, controlled deductions, replicability and generalizability. The interpretivist tradition rejects the notion of value-free research and challenges the tenets of positivist case research (Darke et al., 1998; Piekkari & Welch, 2011): the researchers of this tradition attempt to gain deep understanding of the phenomena under study and acknowledge the subjectivity of the process.

The differences between interpretivist and positivistic traditions are reflected in differences in the questions asked of the data and the types of conclusions wished to be drawn (Lin, 1998). Four main differences can be identified. Firstly, *theorising* in positivistic tradition is variable-oriented, i.e. it seeks to arrive at general causal laws that can predict relationships, which are generalizable across settings (Lin, 1998; Piekkari et al., 2009). As for interpretivist tradition, theorising is not law-like but case-oriented: the focus is on tracing the causal processes that generate outcomes in specific contexts; explanations must take context into account (Lin, 1998; Piekkari et al., 2009).

Secondly, the “depth versus breadth dilemma” related to *case selection* has been one of the most visible topics of dispute (Fletcher & Plakoyiannaki, 2011). For example, both Eisenhardt (1989) and Yin (1994) – the main authorities on the case study approach – take a positivistic approach and have highlighted “breadth” in the sampling of cases. On the contrary, for the advocates of the interpretive tradition, the “depth” of case studies has been one of the main goals (Lin, 1998; Piekkari & Welch, 2011).

Thirdly, both positivistic and interpretivist traditions in the case study share the view that *multiple data sources* are a major strength of the case study approach. However, the rationale advocating this differs. For the researchers representing positivistic tradition, the main rationale for multiple data sources is that it enables triangulation and enhances the construct validity and allows a single, convergent explanation. Researchers from the interpretivist tradition have challenged this and state that triangulation serves rather uncovering diverse explanations.

Fourthly, a difference between the positivistic and interpretivist traditions in case research is *boundary setting*. The positivistic tradition favours a “design logic”, in which the study is anchored to existing literature and where the boundaries and research questions of the study are defined as early as possible, and may even include a priori specifications of constructs before the start of data collection (Eisenhardt, 1989). In contrast, the interpretivist approach favours “emergent logic” arguing that research question and boundaries of the case co-evolve in the course of the research. In the following Table 3 I have summarised and outlined the four main differences between positivistic and interpretivist traditions in case research. I have created the table based on article from Piekkari et al. (2009).

Table 3. Differences between the positivistic and interpretivist tradition in case research (created from Piekkari et al. 2009).

	Positivistic tradition	Interpretivist tradition
Theorising	Variable oriented: The aim of creating causal, generalisable laws and testable hypotheses across settings	Case oriented: The aim is to produce holistic and particularised causal explanations for each case
Case selection	Replication: The inclusion of multiple (4–10) cases to provide replication and analytical generalisation	Richness: Single or small <i>N</i> to provide deep and thick description
Multiple data sources	Convergence: The main aim of triangulation is to enhance the construct validity	Diversity: The aim of triangulation is not only for validating but also uncovering possible diverse explanations
Boundary setting	Design logic: Anchoring the study and research questions in existing literature	Emergent logic: Research questions and the case evolve during the research process

The case studies presented in articles I and III apply descriptive approach and follow the interpretivist tradition. This was due the purposes of the inquiries. As noted earlier in this chapter, the case studies presented in articles I and III aim at theory elaboration. Thus, both studies strived for gaining a deep under-

standing of the studied phenomena. In the cases, multiple data sources were used above all to uncover possible diverse explanations, but also for validation. The boundary setting in the cases followed the emergent logic, typical of the interpretivist tradition: the studies and research questions were only loosely anchored in extant research before data collection. In addition, the critical realist underpinnings as well the critical discourse analysis used in the article III cohere with the interpretivist tradition (cf. Piekkari & Welch, 2011).

The case studies presented in article II follow the positivistic tradition. This was a reasoned choice as article II is the latest of the four articles and attempts to generate new theory and theoretical propositions. The case selection followed theoretical sampling (cf. Eisenhardt, 1989) with two “polar” cases aiming at analytical generalization. Focusing on a small number of cases enabled gaining deep insights into the antecedents of productization of knowledge-intensive services, and into the dynamics of productization processes more generally. In the cases, multiple data sources were used, but this time the main aim was triangulation. Also the boundary setting in the cases follows more the positivistic tradition with anchoring the study in extant research stronger than in articles I and III.

3.2 Case companies

The empirical material in the articles derives from eight Finnish companies. All company names in this dissertation are pseudonyms. In the case study reported in the article I, four small companies were selected to gain deep insight into the experiences and results of a productization project. These companies represented different KIBS sectors: a law firm, a training company, an architect’s office and a marketing company. They all participated in the same productization project to productize one of their services with the help of a consultant.

The case companies described in articles II and III were selected based on the appropriate mix of homogeneity and diversity they provide in relation to service productization: In article II, the goal was to understand why common antecedents of service productization are not sufficient in the KIBS context, and thus theoretical sampling (Eisenhardt, 1989) was applied. This meant selecting two “polar” cases with contrasting outcomes but similar antecedents for productization – ManuCo which was successful in productization and ConsulCo that was unsuccessful. Otherwise, the cases were similar: both cases had limited experience on productization, and sought to productize existing services. Both involved a service requiring expertise and involved employees from multiple units. The characteristics of the cases are shown in Appendix II in Table 2. In article III, the aim was investigate reflexivity to explain how productization has different effects in different social contexts. SoftCorp and the Consultancy were selected because they were similar in the attempts to develop their services through productization and in terms of the number of

personnel and size of typical service projects. The key difference, or diversity, between SoftCorp and the Consultancy was their basic organising models. In sum, the many similarities in contexts as well as a key difference provided a good and fruitful setting for critical discourse analysis. Table 4 introduces the case companies.

Table 4. Description of the case companies.

Case	Established	Employees	Turnover	Services
Article I				
The law firm	2000	8	650 000 €	Contract law and privacy law services
The training company	1986	2	80 000 €	Training, facilitation and courses in preventive law and contracting
The architect's office	1964	14	> 1 000 000 €	Construction management and design services
The marketing company	2005	2	38 000 €	Strategic marketing consulting services
Article II				
ManuCo	1969	> 1 000	> 100 million €	Indoor climate solutions and consulting services
ConsulCo	1958	> 7 000	> 600 million €	Consulting, design and engineering services
Article III				
SoftCorp	1991	60	> 8 million €	Software and consulting services
Consultancy	1984	50	> 10 million €	Consultancy and training services

3.3 Data collection and analysis

3.3.1 Empirical data in the case studies

The interview method was chosen as the primary data collection method in all empirical case studies (described in the articles I, II and III). In articles I and II, a longitudinal case study approach was applied. In article I, the first interview round was carried out in 2006. The follow-up interviews were conducted in autumn 2007 and in summer 2009. In article II, the data on the two cases were collected in two separate research projects over the years 2009-2012.

The observation method was used as a supplementary method in articles I and II. Productization workshops were observed to acquire insights into the actual productization practices and processes as they happened, rather than to rely on retrospective accounts of informants. The timelines of the observation of the productization projects in article II is depicted in Appendix II in Figure 1.

Secondary data, such as service descriptions, annual reports and workshop memos, was used in articles I and II to compare and complement the interview and observational data, and to broaden and strengthen the case evidence where suitable.

In article I, the case study examined a productization project in which four small KIBS productized one of their services with the help of a consultant. Two persons participated in the productization project from each KIBS; they were interviewed at least once during the study. Interviewees in the cases described in articles II and III were selected from different organisational levels to get a versatile perspective and diverse attitudes towards productization. The interviewees were identified and selected in collaboration with the research projects' contact persons in each case company. These contact persons were involved in service development in the case companies and had extensive knowledge both about the people and the services of the companies.

All interviews were semi-structured with open-ended questions. Some specific questions were tailored to better fit the different positions of interviewees and their experience of the themes. For example, tailor-made questions were presented to the managers planning productization activities and to the frontline employees providing productized services. In this way, deep insights from various perspectives were pursued. The interviewees were sent a short description of the research and the main themes before the interview. All interviews were recorded and transcribed. After the interview rounds, the company specific tentative findings were presented in a workshop in each company. This provided interviewees an opportunity to discuss and complement the findings and improved the validity of the study. The workshops also strengthened the understanding of the case contexts.

Non-participant observation was used in cases presented in article I to observe the productization workshops and the company-specific consultancy sessions. The observation data consists of notes that were made during and shortly after workshops and company-specific consultancy sessions. The workshops were also tape-recorded (see e.g. Silverman, 2011), but in the company-specific consultancy sessions recording was not possible due to confidentiality. In cases presented in article II, a participant observation (Whyte, 1979) was used in total of eight workshops during the productization projects, which gave an insider view of what was happening in the projects. Notes were made during the workshops to document the discussions. Table 5 presents the empirical data of this dissertation.

Table 5. Empirical data in the case studies

Case	Data gathered	Primary data: interviews	Secondary data	Additional insights
Article I				
The law firm	Interviews in 2006; Follow-up interviews in 2009	2	Information from web pages	Research collaboration with the case companies between 2006–2007
The training company	Interviews and observations in 2006; Follow-up interviews in 2007 and 2009	4	Non-participant observation in 2 company specific workshops	
The architect's office	Interviews and observations in 2006; Follow-up interviews in 2007 and 2009	6	Non-participant observation in 2 company specific workshops	
The marketing company	Interviews and observations in 2006	2	Non-participant observation in 1 company specific workshop	
Article II				
ManuCo: Case Blue	Interviews in 2011 Observation between 2011–2012	6	Participant observation in 3 workshops Company and service brochures, service descriptions	Research collaboration between 2010–2012 Interviews concerning service development and productization. Workshops concerning productization and its methods
ConsulCo: Case Green	Interviews in 2009 Observations between 2008–2010	6	Participants observation in 5 workshops Company and service brochures, service descriptions	Research collaboration between 2009–2010 Interviews concerning service development and productization. Workshops concerning productization and its methods
Article III				
SoftCorp	Interviews in 2012	9	Company and service brochures, information from web pages	Research collaboration with both case companies between 2012–2014
Consultancy	Interviews in 2012	9	Company and service brochures, information from web pages	Interviews concerning productization and its success in both case companies. Workshops concerning productization and its methods in both case companies

3.3.2 Data analysis

The data analysis of case studies in this dissertation can be divided to three main phases: familiarising with data and coding, within-case analysis, and cross-case analysis. Within-case analysis means the in-depth exploration of a single case as a stand-alone entity (Paterson, 2010). Also in our research, the aim of within-case analysis was profound understanding and description of the phenomenon. The cross-case analysis (see e.g. Miles & Huberman, 1994) was carried out after the single case analyses and consisted of comparing cases in order to identify similarities and differences between cases. Cross-case analysis is a key step in case research when aiming to enhance the generalizability of conclusions (Voss et al., 2002). In articles I and III the emphasis was on the within-case analysis and cross-case analysis was conducted more loosely. In article II cross-case analysis was conducted more orthodox.

In the cases described in the article I, qualitative content analysis was selected as the method of analysis; it is well compatible with case study research and analysing interview transcripts (Hsieh & Shannon, 2005). The analysis focused on experiences and results from a productization project. The steps of the analysis were: orientation in the data and search for statements related to the research questions, forming a matrix for analysis and placing statements in the matrix, answering research questions and linking these answers with the theory. Observation data (notes) and recordings made in the workshops were used for triangulation purposes: to improve validity via multiple methods (Arksey & Knight, 1999).

In the cases described in article II, the analysis focused on organizational and individual antecedents on productization success and failure. The data analysis started from through-reading of the interview transcripts. Based on these overviews, initial ideas were found regarding the impact of organizational and individual antecedents on productization success. After supplementing the overview with other documentation, the textual material was analysed. Based on this initial coding, within-case analysis was performed. To facilitate the understanding of the cases, timelines with key events for each case were also constructed (cf. Langley, 1999). After within-case analysis, the authors independently wrote narratives for each case as well as assessed them in terms of constructs identified in the literature. Cross-case analysis was conducted by comparing the author-specific narratives and by identifying key characteristics of the two cases. Finally, theoretical conclusions were drawn on how various factors affect service productization.

In the cases described in article III, critical discourse analysis (Fairclough, 2003, 2005) was selected as the analysis method. With critical discourse analysis, we were able to structure the text from the interview transcripts along with the representational and actional meanings, discourses and genres. The analysis focused on the accounts given about the definitions, purposes, and objectives assigned to service productization. The analysis consisted of four

rounds. The first round was a generic identification of themes in the data. The second round focused on identifying the discourses of productization and the third one included the first evaluation of reflexivity within those discourses. In the fourth round, the genres relating to these discourses were evaluated in more detail. Table 6 summarises the methods and analysis approaches used in this dissertation.

Table 6. Overview of the methods and analysis approaches in the case studies reported in the articles.

Method	Article I	Article II	Article III	Article IV
Theoretical/conceptual analysis				×
Case study approach	×	×	×	
Within-case analysis	×	×	×	
Cross-case analysis	×	×	×	
Qualitative content analysis	×	×		
Critical discourse analysis			×	

3.3.3 Work allocation in data collection and analysis

The data of this dissertation has been collected from four different research projects during 2006-2012. Below I describe in more detail my role in the data collection and analysis.

In the cases presented in article I, I planned the interview rounds, formulated the interview themes and questions as well as conducted all the interviews. I also designed the standardised observation template (see e.g. Silverman, 2011) and conducted all the non-participant observations. I also analysed the data in all the cases.

In the Case Blue presented in article II, I planned the interview round and formulated the interview themes and questions. The interviews were conducted together with Dr. Aku Valtakoski. The participant observation was also carried out together with him. I carried out the initial content analysis. We presented these initial results to the interviewees of Case Blue. Dr. Aku Valtakoski carried out the main analysis. In Case Green, I planned the interview round, formulated the interview themes and questions as well as conducted all the interviews. I also conducted all the participant observations. I did both the initial content analysis and the main analysis. As in Case Blue, the initial results were presented to the interviewees of Case Green.

The theoretical part of the article III was written in tight collaboration with Mikko H. Lehtonen, me and Tiina Tuominen. I had the main responsibility of the parts discussing service productization and codification. I had the main

responsibility in planning the interview rounds and formulating the interview themes and questions. Both at the Consultancy and at the SoftCorp, I conducted the interviews in which I was assisted by project researcher Jesse Valtanen, who mostly wrote memos. I carried out the coding of the Consultancy's data. The analysis was conducted in collaboration with me and Mikko H. Lehtonen: we interpreted the data and summarised the findings. However, Mikko H. Lehtonen had the main responsibility in conducting the critical discourse analysis. Table 7 summarises the data collection analysis.

Table 7. An overview of the data collection and analysis

Case	Data gathered	Data gathered by	Data analysed by	Conclusions drawn by
Article I				Katriina Järvi and Marja Toivonen
The law firm	2006, 2009	Katriina Järvi	Katriina Järvi	
The training company	2006, 2007, 2009	Katriina Järvi	Katriina Järvi	
The architect's office	2006, 2007, 2009	Katriina Järvi	Katriina Järvi	
The marketing company	2006	Katriina Järvi	Katriina Järvi	
Article II				Aku Valtakoski and Katriina Järvi
ManuCo: Case Blue	2011–2012	Katriina Järvi Aku Valtakoski	Aku Valtakoski Katriina Järvi	
ConsulCo: Case Green	2008–2010	Katriina Järvi	Katriina Järvi Aku Valtakoski	
Article III				Mikko H. Lehtonen and Katriina Järvi
SoftCorp	2012	Katriina Järvi Jesse Järvinen	Mikko H. Lehtonen	
Consultancy	2012	Katriina Järvi Jesse Järvinen	Katriina Järvi Mikko H. Lehtonen	

3.4 Trustworthiness of the study

Qualitative studies mostly aim at exploring, describing and understanding new or unknown phenomena: whereas quantitative studies aim at finding general laws, universalities and generalizable causalities. Traditional criteria for evaluating qualitative research are rooted in the philosophical perspective (positivism) closely associated with quantitative research and methods. These traditional criteria are (e.g. Denvers, 1999; Yin, 1993):

- *Construct validity*: Refers to the quality of the operationalisation of relevant concepts.
- *Internal validity*: The degree to which findings correctly map the phenomenon in question
- *External validity*: The degree to which findings can be generalized to other settings similar the one in which the study occurred.
- *Reliability*: The extent to which findings can be replicated or reproduce by another investigator.
- *Objectivity*: The extent to which findings are free from bias.

Evaluating the quality of a qualitative study is difficult and complex. Many authors have solved the problem by suggesting a broader interpretation of the concepts of validity, reliability and generalizability in order to take into account the distinct features of qualitative studies. Another approach is the application of a totally different conceptual framework. Alternative criteria for evaluating qualitative research have been proposed that are tailored to the different philosophical perspectives and the research designs traditionally employed. The framework presented by Lincoln and Guba (1985) has recently aroused interest among qualitative researchers (e.g. Shenton, 2004; Sinkovics et al., 2008). This framework includes “trustworthiness” as the main concept, and consists of four criteria: *credibility*, *transferability*, *dependability* and *confirmability*. I use these criteria to assess the scientific quality of my research.

As noted by Denvers (1999), the “traditional criteria” and the criteria suggested by Lincoln and Guba (1994) differ only slightly. Sinkovics et al. (2008) have outlined the similarities between these two criteria as following: internal validity corresponds to credibility, external validity parallels to transferability, reliability and stability of results over time equals dependability, and objectivity corresponds to confirmability. Sinkovics et al. (2008) do not include construct validity in their outline. However, construct validity can be seen corresponding to credibility, the truth of the findings as defined by Lincoln and Guba (1985), together with internal validity. Table 8 summarises and compares the positivist criteria and the alternative criteria for qualitative research discussed above.

Table 8. The two major evaluative frameworks for qualitative research (comparison based in Lincoln & Guba, 1985; Yin, 2003)

Positivist criteria for qualitative research (Yin, 2003)	Alternative criteria for qualitative research (Lincoln & Guba, 1985)
Construct validity: Identifying correct operational measures for concepts being studied.	
Internal validity: Establishing a causal relationship e.g. Pattern-matching.	Credibility: Confidence in the truth of the findings.
External validity: Establishing the domain to which a study's findings can be generalised.	Transferability: The transferability and applicability of the results in other contexts.
Reliability: Describes the replicability of the research process and outcomes.	Dependability: Consistency and stability of the findings.
Objectivity: The extent to which findings are free from bias.	Confirmability: A degree of neutrality (objectivity): How decisions were made and how conclusions were made.

Despite the similarities of the actual criteria, the background philosophy is different in the two evaluative frameworks. As the majority of the empirical studies in this dissertation (those described in articles I and III) are interpretive in nature, I have selected the approach of Lincoln and Guba (1985) as the basis of the assessment of scientific quality of my research. In other words, I use “the alternative criteria” of *credibility*, *transferability*, *dependability* and *confirmability*. Article II follows the positivistic tradition in case research, but can also be assessed based on these criteria.

Lincoln and Guba (1985) define *credibility* as the “truth” of the findings, as viewed through the eyes of those being observed or interviewed and within the context in which the research is carried out. In this dissertation the credibility has been addressed by following actions. Data triangulation (Silverman, 2011; Voss et al., 2002) was used in the cases presented in articles I and II by combining interview and observation data and secondary data to add breath, richness and depth to the case descriptions and to enrich understanding. In addition, the data was gathered at different times, which provides a longitudinal perspective to the cases. Researcher triangulation (see e.g. Denvers, 1999; Shenton 2004) was applied in case studies reported in articles II and III, where the same data was analysed in two steps and compared by 2–3 researchers. Respondent validation was applied in the cases presented in the articles II and III: the initial findings were presented and checked in the case companies and discussed with the subjects.

Transferability is defined as the extent to which findings can be transferred to other settings (Lincoln & Guba, 1985). In the case study approach, the possibility of generalisation is related to the theoretical proposition; it is based on

real-world discovery and offers an explanation for the relationship between the concepts investigated (Fletcher & Plakoyiannaki, 2011). Four types of generalizations are possible: development of concepts, generation of theory, drawing of specific implications, and contributing of rich insight (Walsham, 1995). The case studies reported in articles I, II and III are all multiple case studies with cross-case analysis, which provides a good basis for transferability of the results. The reporting of the case studies presented in the articles has also been as thick as possible, providing contextual information (Shenton, 2004) about the cases.

Dependability refers to the extent to which the research would produce similar or consistent findings if carried out as described, including taking into account factors that may have affected the research results (Lincoln & Guba, 1985). In this research, the techniques for establishing the consistency and stability (i.e. dependability) of the results were the following: A clear protocol for both data collection and analysis was used in all the case studies. The interview themes and open-ended questions were carefully planned. All the interviews were tape-recorded and carefully transcribed. In the case studies presented in article I, also the observations were tape-recorded when possible and agreeable by the case companies. Observation was conducted by using a standardised template (cf. Silverman, 2011) during the non-participant observation in case studies reported in article I. Field notes were written during the data collection and observations in case studies reported in the article II. Thorough and systematic documentation and storing of case materials was implemented in all case studies. As recommended by Parkhe (1993), a case study database was established for cross-case purposes to include interview, observation and secondary data.

Confirmability refers to researchers need to provide evidence that corroborate the findings (Lincoln & Guba, 1985). Such evidence can come directly from subjects and research context. In this research, confirmability has been addressed by following strategies. Detailed methodological description and transparency in reporting and analysis allow the integrity of research results to be scrutinised. Confirmability has also been addressed by using researcher triangulation in data analysis (cf. Denvers, 1999; Shenton 2004). This practise was implemented in the cases presented in articles II and III to provide corroborating evidence and to reduce investigator bias. In article I, I gathered and analysed the empirical data alone. In addition, each article has undergone a review process. The papers have also been evaluated by colleagues. These processes of peer scrutiny (Shenton, 2004) provide an external check on research.

4. Review of the findings

In this chapter, the key results of the four articles are presented. Each article is discussed in turn: first the research focus is presented, followed by the main findings. Topics related to the first research question are discussed especially in articles I and II. Moreover, as article II explores the effects of productization on reflexivity, it is linked to the sub-question 1.1. Articles I, II and IV all tackle the issue of how to productize KIBS offerings and are thus linked to the second research question. More specifically, article II analyses antecedents for successful productization and thus contributes to the sub-question 2.1. Article IV discusses how productization and innovation could be interlinked and provides answers to the sub-question 2.2. Articles I and IV both contribute to the development of the framework for customer-oriented productization (sub-question 2.3.). The answers to the research questions are discussed in more detail in the discussion chapter.

4.1 Article I: Seeking efficiency through productization – A case study of small KIBS participating in a productization project

4.1.1 Research focus

The article I examines the nature of productization in small KIBS, whose typical problem is the inefficient production of services starting from scratch for each client. In KIBS customers also actively participate in the production process, which further complicates the delivery. Thus, achieving efficiency is particularly challenging in KIBS.

The article I examines the incentives and motives behind productization as well as the short term benefits and benefits gained in the longer term in small KIBS. It is mainly linked to dissertation's first research question about the motives and perceived benefits of productization. This main research question was specified in article I as follows:

- What are the incentives and motives to productize in small KIBS?
- What are the short-term benefits resulting from productization in small KIBS?
- What are the benefits from productization in the longer term in small KIBS?

The empirical part of the article I examines a productization project carried out in 2006 in which four small KIBS productized one of their services with the help of a management consultant. The methods of data collection were semi-structured face-to-face interviewing and non-participatory observation. The observational data consists of notes that were made during productization workshops and sessions facilitated by the consultant. After the productization project, follow-up interview rounds were made in 2007 and 2009.

4.1.2 Main findings

The incentives and motives to productize services in small KIBS

The empirical findings revealed that the incentives and motives that had led the companies to participate in the productization project were growth and competitiveness, efficiency, improvement of communication, and learning about productization in general.

Growth in sales and in the number of clients was a central motive for productization. The companies expected that their new productized services, which deviated from the traditional focus of their branches, would as such provide competitive advantage. Productization was considered an additional means to find new market opportunities. Productization was also seen as a way to differentiate from competitors. The time-taking nature of customised services worried some of the case companies. Productization was seen as a means to increase efficiency and solve the challenges related to pricing the services. The findings revealed that the problem of *efficiency* also concerns the productization itself: in small companies no one can concentrate full time on the development work. Thus, the participants desired advice on how to reconcile productization and everyday duties.

The specificities of KIBS came out when the participants described the importance and difficulty of communicating their services to customers. Productization *improved communication* as it helped the companies to present their services clearly and attractively to customers. In addition to the above-mentioned concrete issues, the participants were eager to *learn productization practices*, its tools and procedures for example, to better understand customers.

Short-term and long-term benefits resulting from productization

The short-term benefits of the project were observable both in the change of the services and in the change of the companies' ways of thinking. During the project, the companies carried out concrete development work concerning the target service, and in the end they were convinced that they had learned skills that are applicable in other services, too. The main achievements were: realising the importance of the customer perspective, learning how to concretise and document the service content, developing communication styles and preparing

marketing material, and acquiring a general understanding about productization.

The fulfilment of some expectations of the companies could be examined only when the productized services had been on the market for quite a while. These expectations are linked to growth and competitive advantage, and to efficiency. The follow-up rounds indicated that the companies had benefited from the project also in these respects. According to the interviewees, growth had taken place both in sales and in the number of new customers, and efficiency had increased both in internal processes and in marketing. In addition, the benefits perceived immediately after the project had strengthened. First, understanding the perspective of customers had gained more and more foothold in the companies. Secondly, the companies had actively applied knowledge about the tools and procedures of productization, both by developing the case service further and by productizing other services.

Productization framework

On the basis of the analysis of the various theoretical approaches, their managerial applications and the empirical case, the development of framework for productization, Figure 2 below, was started in the article I. The framework summarises productization process, its main tasks and phases. This framework is further developed in article IV where productization is linked to the analysis of user-based service innovation.

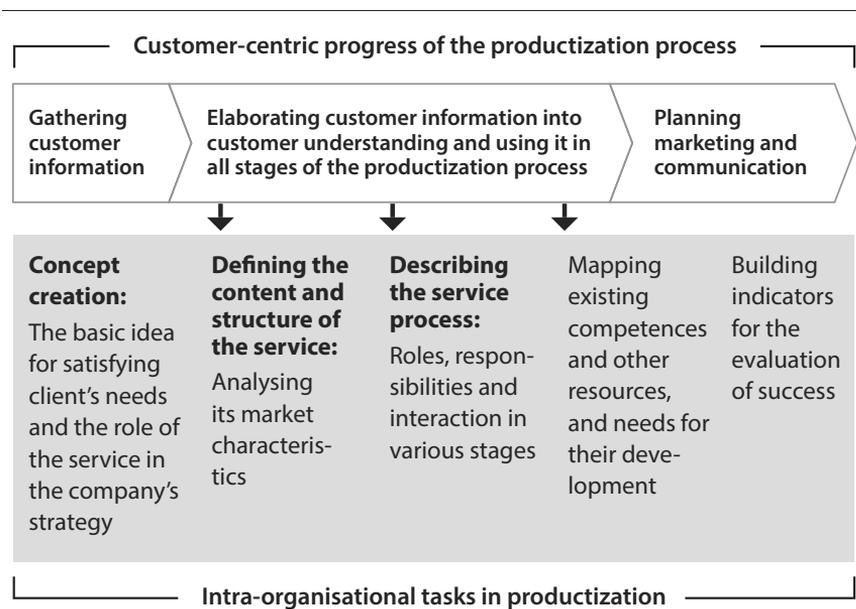


Figure 2. Productization framework: productization process, its main tasks and phases (Valminen & Toivonen, 2012a).

The framework provides a simplified description of the productization process, customer-orientation being the main thread throughout. The beginning and

the end of the process are strongly outwardly oriented – the process starts from the gathering of customer information, and ends with the planning of marketing activities. The interim consists of quite a long stage, where the work is to a great extent carried out within the organisation. However, the goal is to elaborate customer information into genuine customer understanding.

The lower part of the framework describes this intra-organisational stage as detailed tasks. Here the focus is on the elements of the target service. The tasks consist of concept development, description of the content and structure of the service, modelling and analysis of the service process, analysis of the resources needed, and building the indicators for the evaluation of success. The last mentioned task is very important, and on the basis of our study also realisable: measures like the growth of turnover, new customers, and new market areas can be used even in small companies. The description of the other tasks is a summary of Edvardsson's (1997) service model and the models of concept development and blueprinting.

The framework points out the specific challenges that KIBS have in productization. Customer-orientation may be a problem in KIBS companies whose business earlier relied on the transfer of professional knowledge to customers (Cooper et al., 1996). Thus, there is reason to underline the emergence of genuine customer understanding and the ability to communicate about one's service to the customer. The complexity of KIBS offerings makes the communication challenging, and emphasises the necessity to structure the content of the service. A clear presentation of the service content also facilitates the task of pricing – another problematic point in expert services. In the service process, co-production and co-learning are of primary importance in KIBS. However, like general customer-orientation, they may not be acknowledged as an issue in practice: the case companies did not raise them among the particular topics on which they desired advice.

4.2 Article II: Productization of knowledge-intensive services: Enabling knowledge sharing and cross-unit collaboration

4.2.1 Research focus

The article II explores the antecedents of productization success in KIBS. It describes in more detail the intra-organizational aspects of productization: cross-unit collaboration and knowledge sharing. Thus, it is linked to the dissertation's second research question about how to productize KIBS offerings successfully.

As mentioned earlier in the sub-chapter 2.4.2. the nature of KIBS makes service productization challenging. KIBS employees' knowledge, which is mostly tacit and hence difficult to codify, also underpins their status. Thus, employees may oppose productization as it attempts to explicate and codify this knowledge (Heusinkveld & Benders, 2005; Morris, 2001). Second, due to the

typical autonomy of knowledge employees and their powerful bargaining position, given their expertise (Robertson et al., 2003), employees are likely to react negatively to attempts to direct and supervise their work. This further complicates the necessary collaboration between different units.

The empirical part of the article identifies causes for different outcomes in similar service productization processes. The first service productization case, called “Blue” from a firm “ManuCo” was ultimately a success, while the second case, “Green” from a firm “ConsulCo”, failed to achieve its objectives. Otherwise, the projects were similar: both firms sought to productize existing knowledge-intensive services. The main research question of article II can be crystallised: What are the antecedents of productization success in KIBS?

The data on the two cases were collected in two separate research projects over the years 2009–2012. The methods of data collection were semi-structured face-to-face interviewing and participant observation, and firms’ internal documentation related to service productization.

4.2.2 Main findings

Enabling knowledge sharing through goal alignment and trust building

There were only minor differences between case Blue and case Green in terms of the typical success factors of service productization. The extant literature on service innovation has identified two crucial antecedents for service innovation: the participation of frontline employees in innovation (Edvardsson et al., 2013) and the use of cross-unit project teams (Froehle et al., 2000). Further success factors include managerial and organisational support (de Brentani, 1989) and a formalised service development process (de Brentani & Ragot, 1996; Edvardsson et al., 2013).

In terms of positive antecedents, both case Green and case Blue had managerial support, included frontline employees from multiple units in the productization workgroup, and had a project manager; negative antecedents included lack of prior productization experience, lack of a formal service productization process, and limited resources – both cases were side projects to the involved employees. Two factors explaining this difference between the cases emerged from our evidence: goal alignment and trust.

Goal alignment. The first main difference between the two cases was how the goals of individual employees were accommodated during the productization process. The comparison of the two cases reveals the importance of aligning the firm-level goals for service productization with the personal goals of participating employees. If the employees’ needs are not observed and appreciated, they may become uninterested or even alienated from the productization process, which decreases the chances for successful service productization. To summarise the finding 1:

The alignment of service productization project with the goals with those of the frontline employee goals improves their willingness to share knowledge during productization, and consequently improves the chances of success.

Trust. The second major difference between case Green and case Blue was the level of trust the participating employees had in the service productization, each other, and their respective business units. Trust is necessary for expert frontline employees since revealing their knowledge is a decision that entails the risk of others exploiting this knowledge organisationally or financially. In particular, trust in employees from other organisational units appeared to be important for the willingness to share knowledge. Summarising the finding 2:

The level of trust of the participating employees in each other is associated with their willingness to share knowledge during service productization, and consequently affects the chances of productization success.

Enabling cross-unit collaboration through common vocabulary and conflict resolution

In the service innovation literature, a cross-unit project team has been raised to the position of another major antecedent of success. The purpose of the cross-unit collaboration is to ensure the inclusion of the views and knowledge of all relevant parties regarding the service in question. The purpose is also to improve the commitment of the participating organisational units to actually implement the service (Melton & Hartline, 2010). The results suggest that a cross-unit workgroup is not a sufficient antecedent for effective cross-unit collaboration, and subsequently for service productization success. Further factors must thus be considered to explain the differences in cross-unit collaboration between the cases. Two such factors emerged from comparative analysis of case Green and case Blue: common vocabulary and conflict resolution.

Common vocabulary refers to the establishment of common conceptual framework and goals for service productization. It helps to bridge the gaps between the knowledge domains of the organisational units and thus to promote collaboration on equal grounds. Without a common vocabulary for an abstract concept such as service productization, it is difficult to produce tangible results. Summarising the finding 3:

Establishing a common vocabulary and goals for service productization enhances cross-unit collaboration, and consequently improves the chances of productization success.

Conflict resolution helps to mitigate the disagreements and differences between the cases. For example, conflicts in case Green related to formation of common vocabulary, goals and methods of productization. The case Blue and case Green differed with respect to the management of internal conflicts emerging during the service productization process. As the participating organisational units are likely to have their own goals for productization, they

can be conflict with each other. To ensure effective cross-unit collaboration, these differences need to be acknowledged and possible arising conflicts need to be managed during service productization. Similar to the effect of accommodating the individual goals of participating employees, the balancing of conflicting goals can take place at multiple points of time during the service productization process. If these differences and the possible conflicts are not acknowledged and resolved, they can ultimately become destructive, and hinder the progress of the productization project or even cause the failure of the project. To summarise the finding 4:

The resolution of conflicts between participating units in terms of goals and views on service productization enhances cross-unit collaboration, and consequently improves the chances of productization success.

4.3 Article III: Reflexivity in the productization of services

4.3.1 Research focus

Productization requires reflexivity in several respects. Finding a balance between standardisation and customisation both within productization processes and within service delivery processes calls for reflexivity. The article is linked to the dissertation's first research question about effects of productization. The article explores reflexivity in productization in two knowledge-intensive service firms, labeled as SoftCorp and The Consultancy. The data consists of 18 interviews that were collected by using semi-structured face-to-face interviewing, and was analysed by using critical discourse analysis. The main research questions are:

- What kind of reflexivity do productization practices in knowledge-intensive service organisations entail?
- How does service productization affect reflexivity in knowledge-intensive service organisations?

In article III, reflexivity is defined as the ability of people to evaluate and relate things in their social context with each other and with the self. The concept of reflexivity is clarified with three features: the reflexive actor, the focus of reflexivity, and the reflexive distance:

- *Reflexive actor*: The actor is an individual, but reflexive actions in work organisations may be carried out either individually or in social situations, within which social interaction and structures become distinctive features of a person's reflexivity. In other words, people engage in reflexivity within their social context and with other people. Reflexivity can also be induced by specific organisational practices, which may become institutionalised over time.
- *Focus of reflexivity*: In work organisations, reflexivity may focus primarily on work processes and practices, on structures, or both. In article III, these are labelled work-related reflexivity and structural reflexivity. *Work-related reflexivity* focuses on evaluating the current prac-

tices and performance against relevant goals and measures, accommodating available information within processes and adapting performance within work processes and practices. *Structural reflexivity* focuses on evaluating the organisational or institutional structures that are produced and reproduced in work and work organisations. This is involved in the formation, reproduction, and transformation of the rules and resources of structures (Giddens, 1984).

- *Reflexive distance*: Refers to the ability or the possibility of an individual to reflect on their situation when adjusting their behaviour by using multiple sources of information (cognitive distance), or in a separated time and space (temporal and spatial distance). High reflexive distance provides the ability to adjust behaviour and affect structures reflexively, while low distance results in automatic reactions and reflexes (cf. Beck et al., 2003). Productization can be perceived as a process that enables the ability to get reflexive distance from work.

4.3.2 Main findings

Reflexivity in productization in KIBS

The analysis focused on the accounts given about the definitions, purposes, and objectives assigned to service productization. A number of discourses related to service productization were identified in the empirical cases.

At The Consultancy four discourses were identified: improving the sales and production of services, as distribution of information, as an integrative practice, and as a contested practice and a moral issue. The first discourse concerns efficiency: the improving of sales and production. The other two discourses emphasise knowledge sharing and common goals. The fourth discourse tackles the legitimacy of productization.

At The Consultancy, productization was predominantly described as a pragmatic practice for individual consultants and teams – it pays off to codify knowledge and systematise services. A balance between work-related and structural reflexivity was identified, even though work-related reflexivity was the key focus of productization. Indications of work-related reflexivity in each discourse implied that while there was the contestation of the practice and its fit into the company, the overall attitude towards productization was positive. Structural reflexivity provided the conditions and the critical evaluations of productization. Productization also raised a number of structural issues into a collective discussion. The pragmatic need to develop tools and codified knowledge was complemented by the need to develop new rules. This raised the moral values into the discussion, along with some potential fundamental changes that the wider use of productization might bring into the company. Overall, productization was seen to increase integration within, and between, the teams, by providing the consultants with resources, knowledge, and sup-

port. Productization was thought to increase their skills and competences, while providing tools for individual consulting assignments.

At SoftCorp, the identified discourses describing service productization were: productization as improving the efficiency of service business, productization as commodification of services, productization as building a reflexive distance and productization as a control of professionals and manufacturing roles.

At SoftCorp, productization was also presented as a pragmatic practice. The benefits of productization were mostly evaluated from the perspective of the company, rather than the consultants or salespersons. Reflexivity was primarily focused on work processes of service operations and productization, while reflexivity on structures was more limited. Structural reflexivity was apparent in the considerations for organising the development of services through productization, as separate work processes from service operations. Suitability of productization was not evaluated reflexively to the extent as in The Consultancy, and its application remained a management-led effort, where the individual consultants participate, based on formal organisational rules.

Effects of productization on reflexivity in KIBS

Despite the differences in representations, the findings show that the *effects* of productization from an organisational perspective are similar: the organisations' cohesion was increased and the internal variance decreased. In both organisations, the competence base of personnel increased, and each consultant gained new knowledge while being still able to learn in customer projects. However, from the individual's point of view, the effects differed. Firstly, the consequences for the degrees of freedom and the available resources for employees were opposite. At SoftCorp, the autonomy of consultants decreased, as productization resulted in codifying service elements. At The Consultancy, the degrees of freedom were increased as the consultants gained access to a wider knowledge base and service pool but were still able to decide for themselves whether to use the productized elements or not. Thus, the results show that the effects of productization and knowledge codification are not merely about controlling professionals, but may also increase their opportunities and autonomy, depending on the context and related managerial practices.

4.4 Article IV: Towards user-based productization in services

4.4.1 Research focus

The article IV is a conceptual article that supplements the general and intra-organisational issues of productization – discussed in the first three articles – with the perspective of user collaboration. It explores the underpinnings for user-based service productization and brings to the fore the linkages between productization and innovation. As a starting point for these explorations, arti-

cle IV reviews the issues of shared understanding (a central topic in articles II and III) from a new perspective: productization as a platform for learning. The article's main aim is to explore: how productization and service innovation are interlinked and how they can be combined? Thus, it mainly links to the dissertation's second research question about how to productize KIBS offerings, and especially to the sub-question on how productization and innovation could be interlinked.

4.4.2 Main findings

Productization and innovation: productization as a learning platform

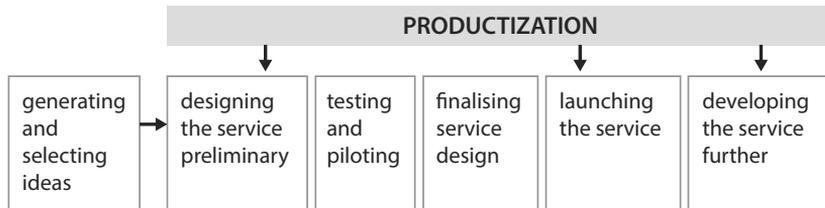
There are two ways in which productization and innovation can be interlinked: an organisation may need a systematisation of its existing service and in the course of this activity innovative ideas emerge, or an organisation may pursue a renewal of a service or a totally new service, and the systematic description of the novelty is a natural part of this activity. Here two types of innovation processes are discussed in particular: the stage-gate process and the process of rapid application (e.g. Toivonen, 2010; Toivonen & Tuominen, 2009).

In the *stage-gate process*, the development of an idea into an implemented innovation takes place as an activity, which is separated from practice (e.g. Cooper & Edgett, 1996). The task may be allocated to the organisation's R&D unit, but in services the establishment of a development project is more common. In this model productization is a natural part of the innovation process in the preliminary service description that has to be carried out before the service is first time tested and piloted. On the basis of user information gathered via these outward activities, the service concept is then modified, this being the next step tightly linked to productization. The in-house modifications and the testing and piloting stages can be repeated several times. Productization comes into the picture every time a modification is needed.

In the *model of rapid application*, a new idea is brought to the markets very quickly after it has been judged to be promising enough (Toivonen, 2010; Toivonen & Tuominen, 2009). Productization starts in the preliminary design of the service, as in the stage-gate model, but later its linkage to the innovation process varies depending on the concrete way in which rapid application is implemented. The first alternative is typical of different kinds of expert services, and it is heavily based on interactive learning with customers and on the utilization of the variety of user experience. The service idea is originally very preliminary and it develops in the customer interaction step by step. Productization is carried out at several points: when some element in the new service is understood clearly enough, it is systematically described as a part of the whole. The second alternative is less open: the idea brought to the markets concerns some clearly limited element or some specific target group of the service. When the experience accumulates, the idea is modified and supplemented, linked to the service more broadly, and applied in broader customer contexts.

Here the productization task is often quite detailed but narrow in the beginning: it concerns the parts of the service, which are first implemented. The next productization task is usually carried out before the broader application of the novelty. This broader application may take place at once or step by step, and correspondingly productization may consist of one big or several smaller efforts. The interaction between productization and innovation may, however, take also the form where productization leads to innovation. Figure 3 describes how productization and innovation can be combined.

MODEL A: Stage-gate model



MODEL B: Model of rapid application

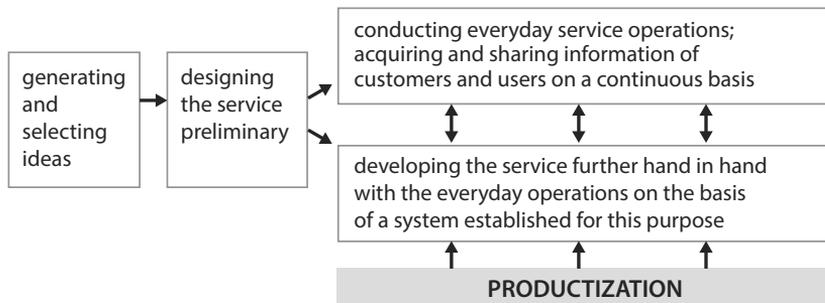


Figure 3. Combining productization and innovation (Valminen & Toivonen, 2012b)

An important benefit is the learning platform that productization and productized services provide; this platform can be used for the accumulation of understanding of users, and for the sharing of this understanding within the organization. This means, for instance, that service descriptions are built via group work where various staff members are involved. After productization, the systematised service forms a basis on which user information can be continuously accumulated, i.e. individual insights emerging in customer contacts can be linked to a commonly understood service description to enable its further development. The emphasis on user-orientation in the productization context means first and foremost the acquisition of sufficient and relevant information of users and the elaboration of this information into shared intra-organisational understanding. Understanding productization as a learning platform helps see how productization and innovation can be mutually supporting processes.

The view on productization as a platform for learning brings to the fore two interlinked tasks: answering the challenge of shared understanding within the organisation, and the utilisation of everyday information that emerges at the customer interface. However, information gathered from customers and users is not applicable as such but must be interpreted and linked to the strategy and goals of the organisation (Nordlund, 2009). Moreover, the needs of customers and users come out in many ways: desires, expectations and requirements. There can also be latent needs that customers are not aware of or silent needs, which they are reluctant to speak about (Ojasalo, 2001; Kärkkäinen et al., 2001). Also these points highlight the importance of interpretation, based on shared understanding.

In the context of productization, a detailed service model, for example the NSD model by Edvardsson (1997), may be a powerful tool that structures the thinking of the actors involved in the task and provides them with a common lexicon. In reconciling the different interpretations of common lexicon, an efficient method is the use of stories or narratives. Stories help people not only to recognise the specificity of their own interpretations, but also to better understand others. A clear and illustrative description of the service in question functions as the framework to which individual staff members can link their new insights emerging in customer contacts. Productized services also support staff members in the provision of information to the customers. Regarding the latter, shared understanding on the basis of carefully conducted productization of services is the most efficient way to secure the further development of the new idea: a common lexicon and shared interpretations achieved via productization restrict the influence of power issues, at best to the realm of differing interests.

5. Discussion

This dissertation has examined productization of knowledge-intensive business services. Its overall purpose has been to build bridges between theory and practice in this topic area and clarify the concept of productization. The last chapter summarises the key findings, discusses and evaluates the theoretical contribution of the dissertation, points out its managerial implications, and shows some avenues for future research.

5.1 Key findings and theoretical contribution

5.1.1 What is service productization?

Advancing the clarifying of the productization concept

Service productization has remained insufficiently discussed in academic research, although it is generally used and its basic contents are well known in companies (Cross & Paquette, 2014; Jaakkola et al., 2007; Werr & Stjernberg, 2003). It is a key means through which KIBS companies – the focus of this dissertation – balance between customisation and replicability of services (e.g. Viitamo & Toivonen, 2013). One of the key outcomes and contributions is the clarification of the concept of productization. In the theoretical part of this dissertation, in sub-chapter 2.2.3, a definition for service productization was presented based on earlier research:

“Productization is a service development approach that through systematising and concretising both the service content and service process aims to create common understanding and to produce the offering in a systematic way.”

However, in this definition, the focus is on the service provider. The definition does not capture the interactive nature of productization of KIBS, in which the role of customers is central (cf. Edvardsson et al., 2005; Brax, 2013). Based on the empirical results, it is also important to highlight that productization aims to add value – both to the customer and to the service provider. This perspective has been pointed out in general service literature (Edvardsson et al., 2005; Brax, 2013; Lovelock & Gummesson, 2004), but not usually linked to productization. Finally, the empirical results indicate that productization does not

mean only systematisation and efficiency, but knowledge codification and learning are central. Productization changes the ways of working in organisations by creating common understanding and new practises to produce the service. The empirically refined definition for productization can be presented as follows:

“Service productization is a service development approach that through systematising and concretising both the service content and service process aims to create common understanding and new practises to co-produce the service and to co-create value together with the customer.”

As the systematic development of services has been studied using different concepts and approaches, other tasks in clarifying and deepening the theoretical understanding on productization were to a) provide an overview of the evolution of the productization debate, b) explore how productization is related to its neighbouring concepts: industrialisation, standardisation, commodification, codification, tangibilisation, and modularisation, and c) analyse the relevant literature streams: service marketing, New Service Development, service engineering, and service innovation. The Figure 4 below summarises the three levels of productization debate, neighbouring concepts, and key literature streams of productization identified in this dissertation.

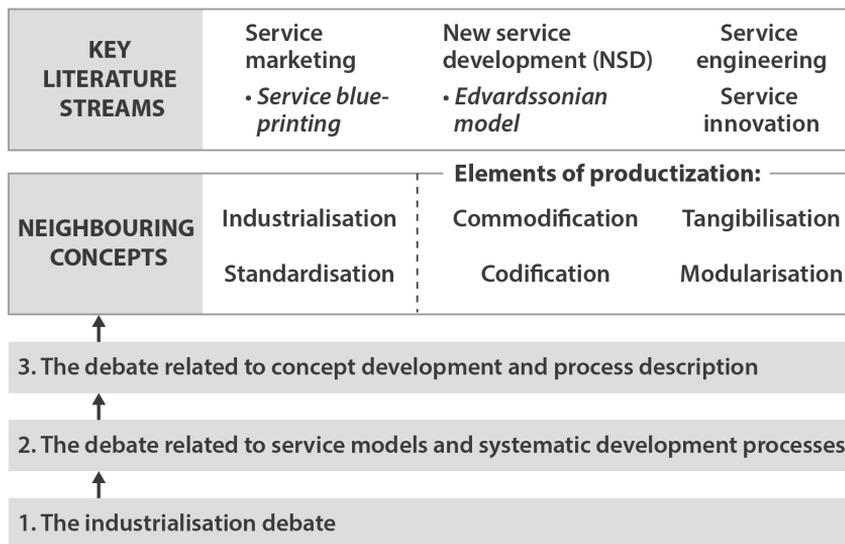


Figure 4. The levels of productization debate, neighbouring concepts and key literature streams of service productization

5.1.2 Why to productize KIBS offerings?

Motives of productization in the KIBS context

KIBS offerings have traditionally been highly customised due their complex nature, and it has been common to end up in unique situations where solutions are strongly based on the specific context and needs of a particular customer. Thus, it is important to identify what the aims and motives for productization are in KIBS companies. This dissertation aimed to fulfil this task and also to explore, what the perceived benefits and effects of productization are.

At the broadest analysis level, the improvement of efficiency and effectiveness can be identified as the main aims of productization in KIBS companies both in literature and in the empirical findings of this dissertation. However, the small KIBS companies, which were the target group in the first case study, use productization first and foremost for growth and efficiency purposes. An important incentive for productization in small KIBS was also the improvement of communication with customers: productization was applied to simplify customer interaction and to improve the marketability of the services (cf. Morris & Empson, 1998; Suddaby & Greenwood, 2001).

Benefits of productization in the KIBS context

The findings of previous research on the productization of expert knowledge indicate that productization can help to integrate activities and knowledge between employees, teams and organizational units (Alvesson & Thompson, 2005; Wright et al., 2012). Thus, productization supports organizational learning and enables the acquisition, sharing and systematisation of customer-related knowledge within the organization.

The dissertation identified both short-term and long-term benefits of productization. *The short-term benefits* gained from productization in small KIBS were realising the importance of the customer perspective, learning how to concretise and document the service content, developing communication styles and preparing marketing material, and acquiring a general understanding about productization. *The benefits from productization in the longer term* were growth in sales and in the number of new customers, and increased efficiency both in internal processes and in marketing.

Effects of productization on reflexivity

The findings of this dissertation indicated that the effects of productization were positive from the organisational perspective: productization increased organisational cohesion and decreased internal variance. Also the competence base of KIBS employees increased as the employees gained new knowledge and learned new things in customer projects. However, from the employees' viewpoint, the effects were ambiguous: productization may increase the con-

trol of professionals, but also increase their opportunities and autonomy depending on the context and related managerial practices.

In sum, the results of this dissertation indicates that the benefits of service productization are multiple, ranging from short-term to long-term benefits, and from increased efficiency to increased knowledge and competence base among employees.

5.1.3 How to productize KIBS offerings?

Challenges of productizing KIBS offerings

In the theoretical part of this dissertation, the challenges of productizing KIBS offerings were explored. Based on earlier research, the following three key challenges were identified: 1) understanding and organising the co-production relationship which is deeper in KIBS than in many other services, 2) reconciling the controversy between shared understanding and professional autonomy, and 3) fostering innovativeness in the context of productization. The empirical findings further suggest that service productization is particularly demanding in small KIBS companies due to a narrower range of skills and scarcer resources.

Antecedents for successful productization in the KIBS context

Literature has identified several antecedents for the success of productization: the participation of frontline employees (Edvardsson et al., 2013), the use of cross-unit project teams (Froehle et al., 2000), managerial and organisational support (de Brentani, 1989), and a formal service development process (de Brentani & Ragot, 1996; Edvardsson et al., 2013). The results of this dissertation indicate that these antecedents are important but need to be supplemented with two others:

The first new antecedent is enabling knowledge sharing through goal alignment and trust building. The findings highlight aligning the firm-level goals in productization with the personal goals of participating employees. They also highlight trust between the employees representing different organisational units – trust is important for the willingness to share knowledge.

The second new antecedent is enabling cross-unit collaboration through common vocabulary and conflict resolution. Establishing a common vocabulary and goals for service productization enhances cross-unit collaboration. The results indicate that to ensure this collaboration efficiently, the possible conflicts between participating units in terms of goals of and views on productization need to be recognised and managed during the productization process. Figure 5 illustrates the new antecedents for productization success identified in this dissertation. It also includes the elements of each antecedent.

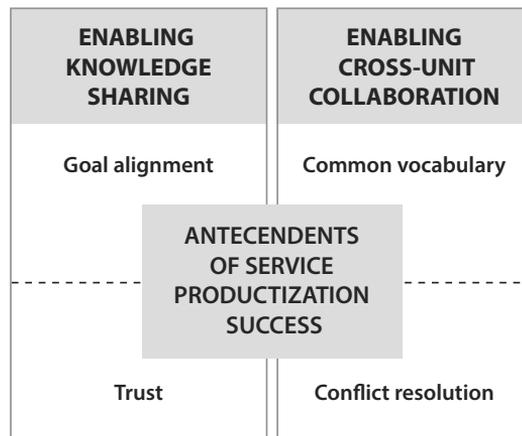


Figure 5. Productization success: the new antecedents

Combining productization and service innovation

Service productization is often seen as a similar process as service innovation (e.g. Gallouj & Weinstein, 1997). Some form of productization is also necessary to systematise the innovation outcome before implementing it organisation-wide and disseminate it successfully in broader contexts (Menor et al., 2002; Stevens & Dimitriadis, 2005). In the following, these two aspects in the linkages between productization and innovation are discussed in some more detail based on the results of this dissertation.

Productization is possible in the context of different types of service innovation processes. In the *stage-gate approach* (Toivonen & Tuominen, 2009), the development is carried out as a formal process from an idea into an implemented innovation. In this model, productization comes into picture every time a modification is needed. In the *model of rapid application* (Toivonen, 2010; Toivonen & Tuominen, 2009), productization starts in the preliminary design of the service, like in the stage-gate model, but later its linkage to the innovation process varies depending on the concrete way in which rapid application is implemented. For example, productization can be carried out every time when some element in the new service is understood clearly enough. The stage-gate model and the model of rapid application are presented in Figure 3 on page 71.

Productization is also linked to innovation because the productization process and productized services provide a learning platform where new knowledge is created, and existing knowledge systematised via an engagement of personnel (Wright et al., 2012). Thus, productization supports organisational learning and enables the acquisition, sharing and systematisation of customer-related knowledge within the organisation. This means that various employee groups should be empowered to participate in productization process. It also means that after productization, customer information is continuously accumulated to further develop the productized service.

Understanding productized services as an opportunity for learning, as a basis to be continuously supplemented with new ideas derived from customer contacts, highlights that productization and innovation are mutually supporting processes. By viewing service productization and productized services as learning platforms (cf. Morris & Empson, 1998; Vaast & Levina, 2006), this dissertation introduces a novel perspective, which differs from the one-sided emphasis on efficiency that still often dominates the discussion.

Framework for customer-oriented service productization

One of the key contributions of this dissertation is the framework for customer-oriented service productization in KIBS companies. The framework, presented in Figure 2 on page 63, has been built to take into account the specificities of KIBS offerings. It provides a simplified description of the productization process, its five main phases and the sequence in which these activities can be undertaken. In addition, the framework emphasises the importance of customer-orientation. As discussed earlier, customer-orientation plays an important role in all service companies (Sundbo, 1997; Sundbo & Gallouj, 2000; Viitamo & Toivonen, 2013), but is especially highlighted in KIBS that involve customers intensively in the problem diagnosis and in the service delivery process (Løwendahl et al., 2001; Morris & Empson, 1998). The framework produced in this dissertation highlights this co-production relationship. Customer-orientation is presented as the main thread throughout the productization process and customer understanding is applied in all phases.

5.2 Managerial implications

The findings of this dissertation have several implications for practitioners. They may interest – not only organisations that are actually planning the productization of their services – but also managers who are responsible for service development.

5.2.1 Managing the service productization process

The framework of customer-oriented service productization provides managers with a simplified description of the productization process. It helps managers carry out productization more consciously and systematically. The five intra-organisational phases (concept creation, defining the content and structure of the service, describing the service process, mapping existing competences and resources, and building indicators for evaluation) give a clear starting point for productization process; it can be thereafter supplemented with company specific phases and tasks. The phases are presented in Figure 6.

Concept creation:	Defining the content and structure of the service:	Describing the service process:	Mapping existing competences and other resources, and needs for their development	Building indicators for the evaluation of success
The basic idea for satisfying client's needs and the role of the service in the company's strategy	Analysing its market characteristics	Roles, responsibilities and interaction in various stages		

Figure 6. The main intra-organisational tasks and phases in service productization (modified from Valminen & Toivonen, 2012a).

The way in which productization projects are managed and organised plays an especially critical role in KIBS companies. KIBS employees may resist productization as it changes the way the professional work is traditionally carried out (Empson, 2001; Morris, 2001; Suddaby & Greenwood, 2001). Solutions to answer this challenge by involving employees in the productization process are discussed in the following.

5.2.2 Involving frontline employees

The significance of the frontline employees, i.e. employees working in the front line interacting with the customers, as a driver for business success is an acknowledged factor (Cadwallader et al., 2010; Engen & Magnusson, 2015). The knowledge of frontline employees is critical for productization in KIBS, since they hold the best understanding on customers and customer needs. Based on the findings of this dissertation, frontline employees should be involved in the service productization process. In addition to the marketing staff, the professionals who deliver the productized service are key actors as they are responsible for the success in implementation of the service.

Enhancing knowledge sharing is important. The potentially conflicting goals of the individuals participating in the productization process should be brought to the fore and negotiated during the process. This dissertation identified two strategies for the promotion of frontline employees' willingness to share their knowledge. Firstly, managers need to ensure that the goals of the productization project are aligned with the goals of individual employees participating in the project. Secondly, managers need to instil a climate of trust within the productization workgroup and combine the workgroup from individuals with sufficient trust in each other. If the participants are mistrustful, they are likely to withhold their knowledge, which will hurt the efforts to productize the service.

Two strategies were also identified in *enhancing cross-unit collaboration*: a) managers can encourage the creation of a common vocabulary for services and service productization, and b) managers can actively resolve the conflicts in

unit goals arising during the productization process. The aim of both strategies is to remove hindrances in inter-unit collaboration during productization.

5.2.3 Maintaining the customer perspective

Since the value is co-created by the provider and the customer together, services require close collaboration with customers (Aarikka-Stenroos & Jaakkola, 2012; Gallouj & Weinstein, 1997; Sørensen et al., 2013). Moreover, customers are not only important sources of ideas, but they have also an important role when the productized services are put to use (Sundbo & Toivonen, 2011). The framework of customer-oriented service productization brings to the fore and highlights the customer-centric progress of the productization process. The main lesson of the framework for managers is maintaining the customer perspective throughout the productization process by applying customer understanding in all phases. This highlights that customer information has to be structured, elaborated, interpreted and shared within the KIBS company in order to be applicable. The customer-oriented progress of the service productization process was presented in Figure 2 on page 63.

5.2.4 Balancing top-down and bottom-up processes

Research on service innovation has shown that innovations can emerge either bottom-up or top-down. In the former case, employees develop new services in an emergent, entrepreneurial fashion (Rubalcaba et al., 2012; Sundbo, 1996). In the latter case, the management initiates a service development process in a deliberate and systematic fashion (Edvardsson et al., 2013). Sørensen et al. (2013) have suggested that success in service innovation requires simultaneous application of both top-down and bottom-up approaches. Respectively, it has been argued that innovative service companies possess a dual structure and consists of an informal social system producing ideas and a management system that both inspires employees and select the ideas that are to be developed further (Toivonen & Tuominen, 2009). The results of this dissertation confirm these arguments. They highlight the general importance of bottom-up initiatives originating among frontline employees and in their practices. The results also underline the importance of managing service productization to ensure the cross-unit collaboration and knowledge sharing. Top-down processes are also needed to disseminate and institutionalise the productized services.

Overall, this dissertation contributes to managerial knowledge in the area of service productization and provides managers with a systematic approach to productize KIBS offerings. The approach of service productization helps them to successfully develop, produce and manage services.

5.3 Avenues for future research

Service productization is still interlinked with similar approaches both among service researchers and practitioners. The variety of approaches maintains a situation in which some actors regard productization as the “iron cages” of organisational control that impede innovation (Wright et al., 2012), and reduce employees’ abilities to identify and respond to customers’ problems and needs (Vaast & Levina, 2006). Others – including the author of this dissertation – consider that productization can support innovation by providing common language, processes and structures through which to capture, exploit and implement existing knowledge (Wright et al., 2012).

One theme that apparently requires more research in the future is the impact of productization. It includes the following types of questions:

- How does productization impact on the efficiency of services and on the profitability of the company carrying it out?
- How does productization impact on KIBS employees producing the service?
- How does service productization impact on customer satisfaction and customer value?

A second arena for the future research could be testing and developing further the framework of customer-oriented productization, particularly towards a more cyclical model. In addition, the current model emphasises the perspective of customers. In the next version, the role and involvement of employees should be addressed as well. Finally, it would be interesting to verify the findings and propositions of this dissertation using larger samples and quantitative methods.

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