

Productization of University Services

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Abstract

Purpose – The importance of university-industry co-operation has been recognized, but it has been faced many challenges such as unclear and undefined service offerings from universities and a lack of mutual content and structures. The purpose of this paper is to analyze how productization of services can be used to enhance university-industry (U-I) co-operation.

Design/methodology/approach – This paper discusses the nature of U-I co-operation while the main focus is on the enhancement of co-operation through the productization of university services. Results are derived from the analysis of both existing literature and empirical case study.

Findings – The study finds that through productization, U-I co-operation can be enhanced and several synergies can be achieved. These are based on well-defined procedures and service packages, which lead to the following things:

- Better quality and management of services leads to more stable, effective and manageable co-operation.
- Communication is more comprehensive and the customer's perspective can be taken more thoroughly considered.
- Productized services are partially standardized and partially customized: standard parts ensure efficient processes while customization ensures the fulfillment of customer requirements.

Research limitations/implications – The paper shows that productization is not a solution for all of the challenges of U-I co-operation. Before productized services are useful, collaborators must engage in active communication to map out the common content.

Originality/Value – Based on findings it is suggested that productization might help educational institutes and firms to develop co-operation in order to gain better results.

Keywords – Productization, university services, synergy in university-industry co-operation

Paper type – Research paper



International Journal
of Synergy and Research
Vol. 1, No. 1, 2012
p. 89–106

1. Introduction

Intense global competition, rapid technological change and shorter product life-cycles have transformed the current competitive environment (Bonaccorsi and Piccaluga, 1994). Organizations have faced increasing challenges in order to sustain their long-term success and prosperity relying solely on internal resources (Santoro and Chakrabarti, 2001). To meet those challenges, universities and firms have started to establish more formal and effective co-operations instead of informal methods (Mead et al., 1999).

Co-operation between industry and universities has been increasingly discussed and studied. The current economic structure of universities has led to a gap between public funding and research expense, which makes co-operation with industry a necessity (Bonaccorsi and Piccaluga, 1994). Universities have started to expedite and prefer a variety of formal collaborative structures which have brought about explicit understandings concerning knowledge and technology transfer as well as two-way knowledge flows (Santoro and Chakrabarti, 2001). For firms, universities are important and natural partners and are a source of new knowledge, technology and procedures (Confederation of Finnish Industries EK, 2009; Santoro and Chakrabarti, 2002). Suggestions of how those relationships should be established and maintained have been proposed, but U-I co-operations have traditionally been informal, casual and based on personal contacts (Mead et al., 1999). As a consequence, the exchange between educational institutes and industry has been undefined.

In such circumstances, there is a great potential in co-operation that enable different people and organizations to support each other by leveraging, combining and capitalizing on their strengths and capabilities. With this potential, public and private institutes and organizations have increasingly begun to require co-operation as a condition of support and competitive advantage. Co-operation is described as a process that allows individuals and organizations to combine their human and material resources so they can accomplish objectives they are unable to achieve alone (Lasker et al., 2001; Lank, 2006). The power to combine the perspectives, resources and skills of people and organizations has been called synergy (Mayo, 1997). It is an essential outcome of collaboration functioning that influences the effectiveness of co-operation (Lasker et al., 2001).

There is a growing need for a method to measure the essential outcomes and synergies of U-I co-operation. The methods that can develop better ways of thinking about needs and addressing them, makes co-operation especially effective (Lasker et al., 2001). In the service business, productization is the natural predecessor of successful market entry and it required in order for services to be successful (Simula et al., 2008). Productization can be perceived as a process which aims at tangibilizing and concretizing service offerings and professional expertise using more systematic processes and methods so that services are more product-like and are easier to buy and sell (Jaakkola, 2011). Hence, productization is a mechanism that links operation, processes and marketing together (Johnston and Clark, 2008). Successful productization will create an increased demand for services, which makes it one of the key success factors (Flamholtz and Aksehirli, 2000). The main output of productization is bundling offerings and deliveries together in well-defined packages so that the expectations of

customers are better fulfilled. Productization creates a positive signal that the service provider understands customer requirements and is willing to respond accordingly (Grönroos, 1984; Simula et al., 2008). The strength of universities lies in the wide variety of services they can offer and productize; different kinds of business-to-business (B2B) services e.g. consultations, research projects and public services like education. Therefore the objective of this paper is to examine how university-industry co-operation can be enhanced through productization.

Firstly this paper will take a look at the key features and elements of U-I co-operation. Then the theory of productization and its benefits will be elaborated. The challenges of U-I co-operation solved by productization are also discussed. The empirical section illustrates a case study which concentrates on the productization of university services. The phenomenon has been examined from the perspective of the University of Oulu, the Department of Industrial Engineering and Management (DIEM) and their main partner. In the conclusion, the research question is revisited and discussions of the findings, implications and further research ideas are presented.

2. University-Industry co-operation

New technology and knowledge development of intra-organizationally has become increasingly difficult in more intensive competitive markets and it has increased the need for inter-organizational co-operation (Barnes et al., 2002; Santoro, 2000). It is clear that working alone is not an option for any organization (Lank, 2006) and that is why university-industry co-operation is seen as a powerful way to provide positive synergy for both parties. In addition, U-I co-operation usually makes a positive contribution to innovations and has helped ensure a return on research and development (R&D) investments (Balconi and Laboranti, 2006; D'Este and Patel, 2007; Santoro and Chakrabarti, 2002).

2.1. The forms and objectives of U-I co-operation

The success of co-operation is always a sum of many things and requires investments from all participants. Firms' motivation is to gain a competitive advantage and addressing business growth, whereas universities want to create new research and offer education. U-I co-operation can be roughly divided into five different categories: research support, knowledge transfer, technology transfer, collaborative research (Santoro and Chakrabarti, 2002) and educational interaction. Basically research support is a one-way co-operation offered by firms. Knowledge transfer also includes some one-way co-operation, but collaborative research and technology transfer always include at least two participants.

Nowadays unallocated research financing is very rare, because firms want answers to specific problems or access to possible future technologies. According to a few Finnish surveys (e.g., Confederation of Finnish Industries EK, 2009; HSE yrityspalvelut, 2009) corporate presentations and info sessions have been seen one of the most important ways to co-operate. These provide information about firms and their business and about

opportunities for students. Firms are thus able to be more attractive employers and are able to recruit highly motivated and educated employees and interns. These internships are very important to both universities and to firms.

Knowledge transfer contains recruiting, consultations, personnel exchange and information sharing. In addition, such interactions can be both formal and informal. The objectives are intangible, because knowledge transfer aims at spreading and sharing information. According to Santoro and Chakrabarti (2002), knowledge transfer helps universities and firms train students in state-of-the-art techniques. Knowledge transfer is a long-term co-operation, which is often focused on discovering something new in ancillary fields. Therefore multi-organizational consortia are typical.

The next two categories are technology transfer and collaborative research. These categories include almost every possible way of doing research and new science. Often this is “invisible” to those who are not working with universities. Technology transfer and cooperative research are probably the most important or at least the most concrete groups for firms. In such instances, universities and firms carry out more specific and coordinated projects, which have an agenda and a formal network (Santoro and Chakrabarti, 2002). The objective of such projects could be service modeling where a university and participant(s) try to create new business opportunities.

The last group is educational interaction, which entails the educational mission of universities. For students, this group is probably the most interesting because it provides the possibility of having current cases to solve. Cases are usually small problems that when solved also benefit firms (Mead et al., 1999). Small student studies are highly appreciated by Finnish firms (HSE yrityspalvelut, 2009).

Real world examples as described by visiting lecturers are a good way of keeping students interested and of providing objective opinions. Visiting lecturers can be a firm’s personnel, who are students themselves. Furthering your education is one of the most common forms of co-operation (HSE yrityspalvelut, 2009). Educational pursuits can be short-term, for example some basic courses, or it can be long-term, for example an MBA or doctorate degree.

Despite its different forms, a general statement is that co-operation is based on trust, good experiences and breadth of interactions, because customer satisfaction and revenues are common evaluation categories especially in the long-term (Bruneel et al., 2010; Mead et al., 1999; Santoro and Gopalakrishnan, 2001).

2.2. The benefits and challenges

There are significant benefits derived from the co-operation between universities and industry to meet the professional development educational and training requirements (Mead et al. 1999). Universities and industry can be seen as complementary and beneficial partners. Co-operation must be beneficial comprehensive and it must always ensure that both sides benefit in order for long-term success. It is difficult to imagine how a co-operation can be synergistic if partners do not respect each other’s contributions, perspectives and needs (Lasker et al., 2001). Nevertheless, the mission of universities is not to serve the current needs of industry, but to do basic research.

U-I co-operation has multiple benefits and there are many reasons to build these relationships. It is also worth mentioning that co-operation has synergistic benefits which continuously increase the significance of U-I co-operation. For example, firms have access to highly trained students and new technologies; increase their resources; enhance a firm's image and grow their business. The competitive advantage is usually achieved with the lower cost of R&D when co-operations are carried out with universities. In contrast, universities can obtain research funding, the latest knowledge and practical problems for students and researchers. In summary, in order to do basic research and be able to create new designs and concepts, university researchers must be familiar with industrial technology and firms have to be capable of creating relationships with universities (Rohrbeck and Arnold, 2006; HSE yrityspalvelut, 2009). Figure 1 illustrates the synergies and the most important benefits to both universities and firms. In addition, figure 1 points out the fact that co-operation in one category can lead to co-operation in different categories.

Sometimes the value or benefit is very difficult to measure or identify, because the outcome can be indirect or intangible. In addition, different forms of co-operation can be related to each other or some co-operations can lead to others. Many times the aim is for an all-around benefit for many different sectors (HSE yrityspalvelut, 2009). This is not a problem, because sometimes the objective can be outside of tangible outcomes. Such an objective can be, for example, in networking or in a better employer image. For these reasons, all of the main forms of co-operation are absolutely important.

U-I co-operation is mostly beneficial, but there are also some challenges – especially in the implementation. Probably the most natural reason for casual and non-systematic co-operation is the lack of workable structures (Confederation of Finnish Industries EK, 2009). Clear contact channels or content that is missing, because co-operations are

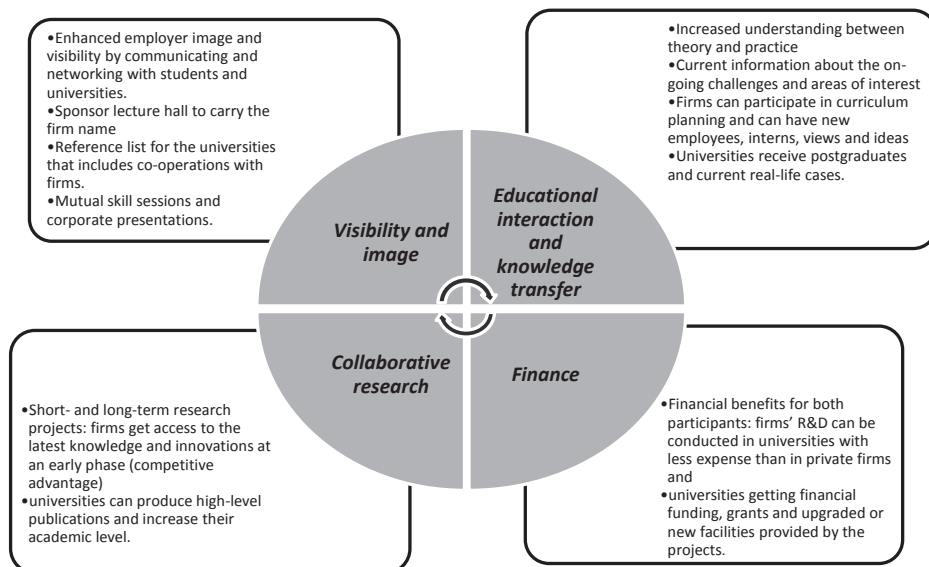


Figure 1:
The synergies and
benefits of U-I
co-operation

associated with some specific people, and therefore needs and offerings are not always met and firms seem to find suitable partners elsewhere (Rohrbeck and Arnold, 2006; Confederation of Finnish Industries EK, 2009; Vironmäki and Jokinen, 2009). Structures can contain multiple things like project planning, methods for problem solving and administration, the terms of contract, offering, outcomes and information exchange. Clear structures, rules and methods create a mutual trust and decrease uncertainty, because trust relies on strong bonds of mutual understanding and adjustment (Bruneel et al., 2010; Chakrabarti and Santoro, 2004).

Especially in applied research, the selection of research areas and themes in co-operation with all participants is important for creating research agendas that serve all participants. However, all of requests from firms cannot be met, so it is better to concentrate on specific competence areas and interests (Johnston and Clark, 2008; Parantainen, 2007). The interests and needs of industrial firms must be taken into account in planning research objects and themes. Firms usually seek deeper information for their business whereas universities are trying to get current data and information from industry. Mapping out the content and interests demands an active two-way information flow and discussion. In addition, academic researchers have also seen the major problems in the differences in orientations. University research is often very theoretical and it is perceived as long-lasting (1-5 years) while firms are usually concentrated on short-term research, because their needs are mostly pragmatic (Bonaccorsi and Piccaluga, 1994; Siegel et al., 2003; HSE yrityspalvelut, 2009; Meyer-Krahmer and Schmoch, 1998).

All of the challenges of U-I co-operation are not mutual. That is why they cannot be solved together, but need to be addressed by a native organization. Challenges in

Challenges are originated from...	
... university:	... university and industry:
People with good personal connections fear that systematic U-I co-operation will jeopardize their personal connections or they will have to share (resistance of change).	
Unclear and undefined service portfolio and - offerings.	
The Slow and undefined internal processes and procedures of universities.	The missing of mutual content and structures
How to take the size and needs of different firms into account.	
Long-term orientation (>1y)	
... industry	
Rapid changes of organizational structure (disappearance of the key players).	
Perpetual hurry and lack of resources.	
Rapidly changing needs.	
Short-term orientation (<1y)	

Table 1:
The challenges of
U-I co-operation.

industrial firms are quite simply mostly financial and connected with the economic situation of firms. Complexity is the reason why problems in universities have a bigger effect on the implementation of U-I co-operation. Table 1 represents the challenges of U-I co-operation and separates them to their origins.

Personal connections act a crucial role, because many co-operations come through these individuals. In the literature, these kinds of people are called champions and their role is crucial especially when co-operation is initiated by inspiring and motivating the partners to strive for high levels of synergy (Mead et al., 1999; Santoro and Chakrabarti, 2001, Lasker et al., 2001). Good personal relationships should be fostered, but at the same time, they should support the mutual benefits and their significance should not be crucial. Instead of closely protecting contacts, attitudes must change. The organization and co-operation would work more effectively if information and contacts were more widely available.

3. Productization of services

Service production has become more productive and fierce competition demands increasingly better services that are provided efficiently. In addition, the need to customize services for each individual customer remains and customers need a clear understanding what is can be expected (Saaksvuori and Immonen, 2008). Productization enables the creation of concrete understandings of customer content of the service, how it will be produced and which parts can be tailored to meet customer specific requirements (Johnston and Clark, 2008; Parantainen, 2007).

3.1. Productized services

Productization is a shift from unique service-intensive customer projects towards tangible standardized products aimed at markets (Alajoutsijärvi et al., 2000). Productization, or a service concept, is an essential element in defining an offering and it starts with a deep understanding of services and customers. It demands an analysis of the needs of the customers, designing the service and developing the ability to produce in order for mutual objectives to be met (Johnston and Clark, 2008; Sipilä, 1995). Therefore productization is a key factor that demonstrates the potential value and quality of the service for customers (Johnston and Clark, 2008; Saaksvuori and Immonen, 2008).

Sipilä (1995) has recognized four different levels of productization. On the first level, internal productization, organizations try to make sure that development is well executed the first time and that after words there is no need to do it again (Lehtinen and Niinimäki, 2005). Internal productization is a natural phase, if services are desired to produce as effectively as possible. In addition, standardized and defined internal processes make it possible to repeat a service multiple times (Saaksvuori and Immonen, 2008).

The second level is the development of supporting processes. Organizations develop methods or systems that enhance the effectiveness of customer care. On the third level, service is fully productized and property rights or licenses can be resold. Services are also defined and form clear entities, which can be offered to customers

as is or modified (Saaksvuori and Immonen, 2008; Sipilä, 1995). The total chain of processes must be described if services are to produce and provide effectively (Johnston and Clark, 2008).

The last level is repeatability, which means that a service is packaged in a specific form to be delivered using a distribution network. All of these phases and levels are not necessary as long as the quality and effectiveness of the processes can be ensured. This depends on a strategy, customers and how the competition is situated (Saaksvuori and Immonen, 2008; Sipilä, 1995).

Productization can describe the nature of services provided by the whole organization, or refer to individual services as a part of a service portfolio (Johnston and Clark, 2008). However, a well-structured and productized service portfolio can be seen as a potential driver of agility. Portfolio strategies are often created concurrently with other organizational capabilities making most services architectures difficult to imitate (Voss and Hsuan, 2009).

3.2. How to create a well productized service

There are six common milestones to create well productized services. Milestones help service providers to identify, which phases they have achieved and where they still need to improve (Parantainen, 2007; Sipilä 1995). The milestones are the following:

1. Some procedures are starting to stand out. Service providers have started to use or copy such procedures, which have worked well in the past.
2. A service gets a name and it takes shape. Small and simple services can have a price.
3. The content becomes stable, which makes solidifying the price possible.
4. The real signs of productization are beginning to emerge; services start to multiply inside of the company, moving from person to person.
5. Services start to multiply outside of the company. The previous steps can be unintended, but this is the first step that is done in purpose. At this stage, the steps and phases of services must be well documented allowing for the repetition of services outside of the company – with or without developers. Usually at this phase, service is divided into modules to help the customization.
6. Services are ready for resale and delivered via the distribution network.

Productization improves value creation and makes it easier in multiple ways. For example, standardization and scalability is facilitated by productization. Without productization and standardization, it is possible to over engineer the processes, which usually decreases the effectiveness (Saaksvuori and Immonen, 2008; Simula et al., 2008). Scalability comes from customization, which helps customize services for each customer and helps to manage the supply chain better (Hsuan, 1999).

Productization is not just putting services in well-defined packages; it is the set of interrelated tasks that together create a service. At the same time, it is a continuous improvement process. The purpose of productization is to provide a clear picture of the offering of organizations and what the customer receives. Productization specifies services and guarantees a shared understanding of the value of the services. It has been discovered that good service reduces conflict and increases customer loyalty. Such customers are less likely to change service providers.

4. Industry co-operation at the University of Oulu

Emphasizing the third mission of universities and the changed economic structure has forced universities to reconsider the position of industry co-operation. At the moment, co-operation between the University of Oulu and industry is fruitful, but it is casual and mainly limited to a few people. The issues faced by firms are often impossible to simulate in laboratories and as a consequence research in technological and applied fields, like the Industrial Engineering and Management (IEM) require contact with industry. Industry co-operation plays a very important role in achieving the objectives of teaching and research which is needed in order for universities to influence society (D'Este and Patel, 2007; Vironmäki and Jokinen, 2009)

4.1. Case study

The research data was collected from interviews. The aim of this study was to investigate the needs and possibilities for productization in the context of U-I co-operation. That is why interviews were conducted in the DIEM at University of Oulu, and at one case company who was considered one of the main partners. The case company is one of today's most highly valued electronic and high-technology brands in the world. The company has stated that the strength of the Finnish innovation system comes from the wide-scale co-operation between universities and industry. The potential of universities and institutions should be better utilized and the number of creative co-operations should be increased.

A case study strategy was used in this research. A case study is an empirical research tool that studies a phenomenon within its real-life context. When research is in the early stages and the boundaries between the phenomenon and its context are not clearly evident, a case study is appropriate and can provide new insights. Evidences can be collected from multiple sources (Ahola et al., 2008; Eisenhardt, 1989; Yin, 1989). As earlier stated, there is not much of research or data on co-operation frameworks and how they are organized.

Thirteen interviews were carried out [1]: three for university representatives, three in DIEM and seven in the case company. Every firm representative, composed of one director, one head of business excellence, three program managers and one senior manager, were high ranking and experienced. University and DIEM representatives were composed of two professors, one head of department and three researchers. In spite of different job descriptions of the all of the representatives, have lots of experience with U-I co-operation. Interviews were done individually, except for one interview where two people were present. The number of interviews was not limited in any way, but the purpose was to get enough data so that saturation point was reached. Because natural discussion and flexibility were seen as very important for this research, the questions were broad and the interviews were quite loosely defined. For the purpose of credible and reliable research, all interviews were recorded and transcribed. The interviews concentrated on the following topics: the present situation, experiences, organizing, benefits and the development of U-I co-operation. The main focus was still in the development of co-operation through the productized services of universities and how productization was seen as a fit for U-I co-operation.

4.2. Results

In general, U-I co-operation was seen as important for every participant and even for the development of a local area. Experiences have been good and the personnel in firm and university were willing to continue. Interviewees also believed that co-operation has had a positive impact on competitiveness, but in the long-term it has been very difficult to measure or prove. Traditionally, co-operations have been concentrated in different areas and on short-term and long-term research projects.

At the moment, U-I co-operation seems to be experiencing “a depression”. Co-operation has been carried out in many ways, but the potential has not been fully exploited and it has not served the needs of the participants as much as possible. The problems are mainly related to the challenges that have already been recognized:

- No clear content and objectives for co-operation,
- co-operation bounded by personal contacts and interests,
- the common and mutual structures are missing and
- co-operation should be wide-scale and more synergistic.

Many firm representatives have said that U-I co-operation is fully bonded to personal interests and connections. That could be one reason why there are no signs of tight objectives for co-operations. Only some qualitative objectives were stated. For example, that co-operation should only be carried out with top-researchers or top-universities. However, many interviewees, mostly from the university, said that there should be some goals and objectives to ensure the effectiveness and success of co-operations.

It was made pretty clear that information must be shared more effectively between a university and a firm in order for mutual content to be found. If co-operation is expected to last and to be valuable, there must be some content and meaning for co-operation. Content cannot be created from scratch, but it must be related to the partners' complementary competencies and interests.

Compared with normal service providers, many universities have not brought out and advertised their expertise and offerings. One of the university representatives mentioned: “Profiling of our skills and competencies is crucial if we want to promote our know-how to collaborators”. If universities want to act as a service provider and co-operation is desired, there must be something concrete that can be presented to firms.

According to interviews, it seems to be clear that universities should productize their services and create a service portfolio. If long-term industry co-operation is to be more systematic and appropriate, information should be spread more actively and universities should be able to present their service offerings and portfolios clearly. The productization of services is absolutely a solution; a clear portfolio could solve and clarify many problems.

4.3. Productization of a course assignment

It has been shown that U-I co-operation has essential benefits for both industrial firms and universities, but it suffers from a lack of structures and awareness of services as well as from the common challenges that U-I co-operation has usually faced. Thus, it is justified that the productization of services is one possible way to unify and systematize

the offering of universities. This would enhance U-I co-operation and concretize the offering for customers and help in finding mutual content and structures.

Based on the findings of this research, it was decided that one of the DIEM's course assignments to be productized in order to overcome the challenges related to U-I co-operation. The need for such productization was well justified: multiple student groups were carrying out the same task with different firms. Basically the description of the assignment was created in order for every single firm to get a clear conception of the requirements. In figure 2 the main elements of productized university services are shown. Elements are very much familiar with the literature, but in the case of university services, the value for students and universities must be emphasized, because the objectives may be educative – for example in small assignments.

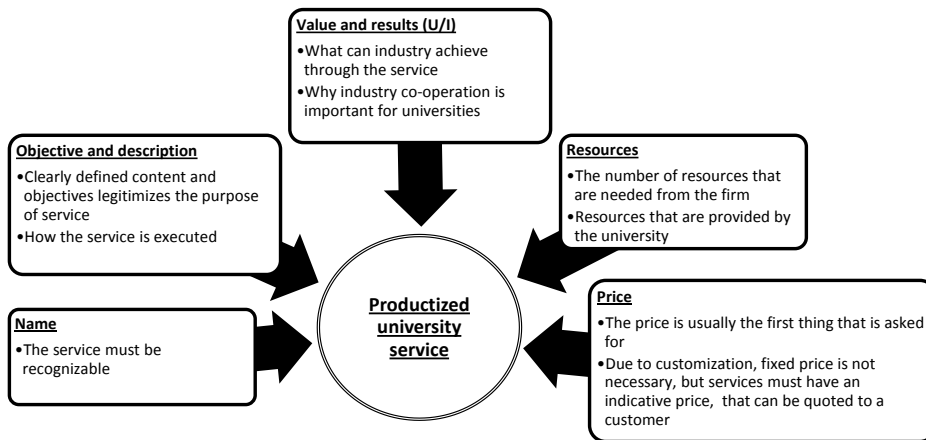


Figure 2:
The main elements of
productized university
service

5. Discussion

In accordance with the current literature (Meyer-Krahmer and Schmoch, 1998; Rohrbeck and Arnold, 2006), our empirical study confirmed that U-I co-operation is considered very important, almost a necessary, from both perspectives. However, the main contribution of this study implies that, synergy in U-I co-operation can be enhanced through the productization of university services. In order to be efficient, collaborators must have something useful to share or they must have common goals and objectives, which can be achieved by working together. One of the restrictive factors concerning the decisions about participating is their perceptions of the benefits and the sacrifices involved (Lasker et al., 2001). That is why the proper identification of the needs and benefits of both parties is important for success. Other issues mentioned is the cultural gap between industry and universities, which must be bridged through different actions by the participants so that the language and nature of the organizations are clear to the collaborators. The third critical success factor is the management structures including knowledge generation and exploitation as well as their rules and regulations.

Through the productization of university services, most of the challenges are related to vagueness, a lack of systematic ways to provide services and indefinite service offering can be solved. The value of productized services is much easier to measure and identify with productization, because services are clearly defined and the content is well-known. Table 2 discusses the challenges of co-operation that can be solved through productization.

Challenge:	<ul style="list-style-type: none"> • Solution through productization
Long-term orientation (1-5y) vs. short-term orientation (3mm-1y)	<ul style="list-style-type: none"> • Defined services help to determine content and objectives. • Suitable services and forms can be easily found. • Different types of orientations and requirements can be taken into account.
Theoretical approach vs. pragmatic approach (long-term vs. short-term)	<ul style="list-style-type: none"> • The theoretical approach is a standard part of any university's research procedures. These are defined and explained in the service description. • Services can be modified to match the needs of the customer with customization.
Bonded to some person & variable organization structure	<ul style="list-style-type: none"> • Services are clear entities that are available and accessible to all people. • Personal connections and variable organization structures are no longer restrictive.
No clear contact channels and content	<ul style="list-style-type: none"> • Productized services and concepts are concrete and easily exploitable. • Productized services contain plenty of details, such as contact information.

Table 2:
The challenges that can be solved through productization.

Productization is a continuous process, which aims for cost efficiency and customer orientation. In general, productization can be divided into two steps: inbound and outbound productization. Before services are being offered and value can be produced, internal processes must also be productized. After that, effective value producing and service offering, outbound productization is possible (Simula et al., 2008). With those two steps, universities are able to implement productization as a part of their key processes (Valminen and Toivonen, 2007) and most of the challenges with U-I co-operation can be solved or at least be reduced. With productization, universities can define their service portfolio and concepts more systemically and enhance their role as a service provider. The benefits of productization are based on well-defined procedures and services packages, which lead to the following success factors:

- Better quality and management of services leads to more stable, effective and manageable processes.
- Communication with customers is much easier and customer perspectives can be taken into account to a greater extent.

- Services are partially standardized and partially customized; standard parts ensure flexible and efficient processes while customization ensures the fulfillment of customer requirements.

Although the benefits of productization are undisputable, it is surprising how few organizations have clearly defined service concepts (Johnston and Clark, 2008). Productization inevitably leads to increased competitiveness and more valuable results. Usually, good service reduces conflicts and increases customer loyalty. In addition, such customers are less likely to change a service provider (Johnston and Clark, 2008). Sadly, the U-I co-operation has been restricted to personal contacts and to some extent it has had a negative impact on the number of co-operations. Personal contacts are important, but those may not be limiting factors (Lank, 2006). Productization enables the processes of co-operation to be standardized and stated. Naturally, this means that more people can benefit from co-operation and it would be less dependent on the competence of individual experts.

Productization makes the implementation of co-operation easier and enhances the significance of co-operation by realizing its full advantage. Because universities have already recognized the importance of U-I co-operation, the most important thing is to emphasize universities role as considerable partners. When universities clearly present their service portfolio as “a menu”, any firm – especially new applicants – can be aware of the service offering (Parantainen, 2007). We can presume that when the gaps and risks are minor, it encourages firms to start or to increase the amount of co-operation. By that, universities would be more capable of serving firms and people in their region and act as a social influence, which is the third mission of universities. It can be assumed that the more partners’ universities have the more funding they will receive.

In spite of benefits, productization is not the key to opening co-operation, because effective co-operation demands that offerings and needs meet each other. The implementation and opening of the co-operation demands active and two-way communication (Lasker et al., 2001). In that phase, productization has the biggest influence. It concretizes the offering, helps to fulfill the needs of the collaborators. In addition, clear structures, rules and methods create mutual trust and decrease uncertainty, because parties see the relationship itself as valuable and are more willing to establish a relationship. Such things can have major positive effect on synergy in U-I co-operation and its sustainability.

5.1. Implications to synergy in U-I co-operation

The major managerial implication of this research is that universities need to pay more attention to productizing of their expertise and services. The frameworks developed thus far do have not identified the processes that enable co-operation to accomplish more than individuals and organizations alone can (Lasker et al., 2001). At this moment, it appears that industrial firms are not aware of the offerings and services that the universities can offer (Confederation of Finnish Industries EK, 2009). Richardson and Allegrante (2000) have noted that “we need co-operations because most of the problems we will face in the 21st century will require multisectoral, multidisciplinary and multicomponent efforts”. The synergy created by co-operation can be very powerful. Especially when

it bring together diverse parties (Lasker et al., 2001), like universities and industry. Co-operations with diverse participants, whose different kinds of abilities, traits and attitudes bring strength, may have the potential for enhancing U-I co-operation and synergy within it.

The potential of co-operation, which is reflected in co-operation goals and objectives, derives from the strengths that emerge when individuals and organizations are brought together. Particularly when the people involved contribute different kinds of knowledge and perspectives (Israel et al., 1998). To create synergy from such diversity, there is a need for a process, which can exploit different perspectives, skills, resources and needs. By the productization those different variables can be taken into account and ensure that the results better meet the requirements. At the same time, with more systematic co-operation, the personal relationships and changes of organizational structures are no longer dominant. Because of the decreased workload and the better quality and productivity of co-operation, it can be argued that after productization, firms would have more desire to participate in U-I co-operation.

Productization delivers all-around benefits by developing universities internal processes and procedures, which has a direct impact on the quality and effectiveness of work. At the same time, productization also sets clear requirements for industry on how to purchase services, what those offering are and what kinds of resources are required from them in service production. The ability of productization to identify and focus on problems that matter to the participants, to communicate how the actions will be executed and to document its accomplishments can significantly enhance U-I co-operation. In many co-operations, participants have had little influence or involvement in what these co-operations do (Lasker et al., 2001) and it has generally been difficult to document and evaluate the effectiveness of U-I co-operation in achieving goals and objectives. The synergy that a co-operation achieves is reflected in the way partners think about the achieved objectives and goals. It is not possible to determine the extent to which synergy is achieved, since there is not a way to measure synergy. By productization the achievements and results of co-operations can be unambiguously concretized and evaluated, because the content and objectives of the productized services are established and well known when the service is offered and sold. Finally, the importance of process and outcome measuring is crucial for a co-operation development and empowerment evaluation.

Service production is always a set of interactions between the supplier and the customer. With productization, those interactions can be made more appropriate and the needs and objectives of both industrial firms and universities can be fulfilled better. However, firms should remember that the main mission of universities is to do research and create new science instead of subcontracting work for the industry. That is why universities' approach is usually perceived as very theoretical and research areas can be completely new, hence satisfactory results cannot always be guaranteed. The risks of conflicts can be decreased with good advanced planning and effective two-way communication. Active communication and planning, which forms the basis for joint problem solving, are also essential resources for achieving synergy.

6. Conclusions

In this paper, the main focus has been to examine the productization of services in the context of U-I co-operation. Based on our research and findings, it can be argued that productization is one way to enhance U-I co-operation and it emphasizes its synergistic benefits. Productization links operation, processes and marketing together (Johnston and Clark, 2008). Through the productization, university offerings could be clearer and better defined; thus the missing structures and content could be easier to find. The lack of a clear understanding of what a university can provide for industry leads to perceptions that university research and co-operation is too theoretical for their needs (Confederation of Finnish Industries EK, 2009). Productization leads to more synergistic co-operations, which are able to identify and engage partners with a complement skills, resources and perspectives to give the group a full picture of the problem.

Productization is not a solution to all of the challenges in U-I co-operation. Many of those can be solved within the university or the department, but we still need to map out the needs of the firms and the common content for co-operation. In the interviews active information sharing was suggested as being a solution for the discussion about needs and offerings. Probably, the only way to facilitate synergistic thinking is through continuous communication between universities and firms, where the productized service portfolio acts as an element supporting the objectives and interaction. That kind of arrangement could work quite well, because it would be easier to respond to customers' requirements and achieve their own objectives. These create a basis for long-lasting and mutually beneficial co-operation.

Despite the positive results of this study and a sufficient amount of empirical data, there are some shortcomings in this research. The main criticism can be focused on the narrow aspect of interviews. Although, the number of interviews was adequate, interviews were conducted only at one large company. It could be possible that if interviews were done at several firms, in different fields of business fields, or in small and medium enterprises, there could have been different results. On the other hand, the achieved results are consistent with current literature, so the results of interviews can be regarded as reliable and they can be used in the development of co-operation between DIEM and firms. Because the implementation of ideas and results cannot be presented in this study, further research should be focused on the impacts of productization on the development of U-I co-operation.

7. References

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[1] Interviewees of this study.

Rank of the interviewee	Organization	Date	Duration (min)
Ph. D student	University of Oulu	30.6.2010	39
Chief of Department	University of Oulu	6.8.2010	49
Research, Ph.D	University of Oulu	28.6.2010	41
Ph. D. student	DIEM	24.6.2010	24
Professor	DIEM	29.6.2010	34
Professor, Head of Department	DIEM	22.6.2010	38
Director	Case company	1.7.2010	29
Program manager	Case company	1.7.2010	43
Research team leader	Case company	8.9.2010	37
Head of business excellence	Case company	27.9.2010	52
Head of product data management			
Program manager	Case company	28.7.2010	29
Program manager	Case company	27.7.2010	77
Senior manager	Case company	1.7.2010	36