LAPPEENRANTA UNIVERSITY OF TECHNOLOGY

Faculty of Technology Management - Department of Industrial Management

MASTER'S THESIS

Cross-Border Innovation Support Platform for the SMEs: The Case of St. Petersburg Corridor Region

The subject of the thesis was approved by the council of the Faculty of Technology Management on the 29th of October 2007.

Supervisor of the thesis Professor Marko Torkkeli

Instructor Katja Keinänen

In Kouvola 14th of November

Hannu Käki

Eräpolku 11 a 10

45130 Kouvola

+358400642170

ABSTRACT

Author: Hannu Käki

Title: Cross-Border Innovation Support Platform for the SMEs: The Case of St. Petersburg Corridor Region

Department: Industrial Management

Year: 2007 **Place:** Kouvola

Master's Thesis. Lappeenranta University of Technology.
86 pages, 8 tables, 15 figures and 2 appendices
Examiner: Professor Marko Torkkeli

Keywords: innovation broker, innovation system, St. Petersburg

The thesis studies different mechanisms on cross-border innovation promotion from a small and medium-sized enterprises standpoint. The case environment consists of South-East Finland and North-West Russia which forms the St. Petersburg Corridor Region. The aim is to find further specifications for these mechanisms.

In theory a framework was created for an innovation support platform. Based on this model was conducted a survey in the case environment. The respondent group included representatives from industries, research institutions and governmental parties.

The innovation system was open towards new methods. The implementation method, however, was not commonly shared. Better collaboration between the actors is needed hereby to enhance communication to companies' course. To promote innovations, expanding a network such as Innovation Relay Centre to the Corridor region is suggested, and utilizing and applying its technology transfer –model and international network. As a promotion support an innovation database –tool should be used.

TIIVISTELMÄ

Tekijä: Hannu Käki

Työn nimi: Rajat ylittävä innovaatioiden edistämismenetelmä pk-yrityksille: St. Petersburg Corridor Region -case

Osasto: Tuotantotalous

Vuosi: 2007 **Paikka:** Kouvola

Diplomityö. Lappeenrannan teknillinen yliopisto.
86 sivua, 8 taulukkoa, 15 kaaviota ja 2 liitettä
Tarkastaja: Professori Marko Torkkeli

Hakusanat: innovaation välittäjä, innovaatiojärjestelmä, Pietari

Työssä tutkitaan eri mekanismeja rajojen ylittävään innovaatioiden edistämiseen pienten ja keskisuurten yritysten näkökulmasta. Case ympäristönä on Kaakkois-Suomen ja Luoteis-Venäjän alue eli Pietarin Corridor. Tavoitteena on löytää tarkemmat määritykset ja rajaukset näille mekanismeille.

Teoriassa muodostettiin viitekehys rajojen ylittävälle innovaatioiden edistämismallille. Mallin pohjalta toteutettiin haastattelututkimus, joka suoritettiin case-ympäristössä. Haastattelujoukko koostui yritysten edustajista, tutkimus-henkilöstöstä sekä julkisista toimijoista.

Innovaatiojärjestelmä oli avoin uusille toimintamenetelmille. Menetelmien toteuttamistapa kuitenkin jakoi mielipiteitä. Toimijoiden välille tarvitaan parempaa yhteistyötä ja tämän kautta selkeämpää kommunikointia yritysten suuntaan. Innovaatioiden edistämiseen ehdotetaan Innovation Relay Centre tyyppisen toiminnan laajentamista Corridorin alueelle sekä sen käyttämän teknologioiden välittämismallin sekä kansainvälisen verkoston hyödyntämistä. Edistämisen tukena tulisi käyttää innovaatiotietokanta-työkalua.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

EU	European Union
IP	Intellectual Property
IPR	Intellectual Property Rights
IRC	Innovation Relay Centre
ITC	Innovation-Technological Centres
R&D	Research and Development
SME	Small and Medium-Sized Enterprises
TI	Trusted Intermediary

1 INTRODUCTION

During recent the word innovation itself has become a trend. Therefore, the ultimate definition of an innovation is sometimes forgotten in conversations: *innovation is something that has commercial value*. For decades companies' research and development (R&D) capabilities and processes have been studied. However, recently the level of innovation system examination has extended from the organisations' level to regional and national level, and even the European Union has its own objectives. Somehow all these levels should be connected to each other so that the higher level of the system could implement enabling actions to increase the performance at lower levels. Ultimately, the high innovative performance, such as new companies, products, vacancies and growth of companies impacts the whole economy. As Howells (2005) argued to be effective innovation policy at the regional level needs coordination and reconciliation of all these different perspectives. Further, Lecocq and Demil (2006) demonstrated that open systems for sharing the knowledge and boosting the innovations will be in a crucial role. Hence, this study is highly motivated by more open innovation structures at regional level.

Finland and Russia have a long shared history, also as trading partners. During the last decades several cooperation projects and programs have been conducted. However, the main emphasis has been on trading products. Between South-East Finland and North-West Russia are located the busiest common checkpoints of these countries and besides the commodities many people cross the border daily. The potential for a more systematic development of cooperation between these two regions has been recognized. In addition, the city of St. Petersburg, near the border, has the same amount of people as the whole of Finland. All this suggests a good basis for further collaboration and common objectives.

In 2005 the representatives of these regions signed an agreement on cooperation. The whole programme was called *St. Petersburg Corridor Programme*. It shares a vision to build the Corridor area to be an economically, functionally and socially coherent entity

by 2013. (Psarev, 2007) One workgroup in the St. Petersburg Corridor concentrates on improving the innovation landscape in the region.

1.1 Objectives and Restrictions

The goal of the study is to find mechanisms to enhance cooperation between South-East Finland, North-West Russia and St. Petersburg in the field of innovations. More precisely, the mechanisms of innovation support system for the region are studied. Special focus is on small and medium-sized enterprises (SMEs) and on promotion of their activities. SMEs play a crucial role in the European economy and they are fast to react to the environment but on the other hand they lack of resources (European Commission, 2006).

Thus, the main questions of this study are defined as follows:

- What are the structures and the roles of the actors to support the innovations in the region? In other words, how should the innovation network be established?
- What kinds of services are needed to promote the innovations?
- What kinds of mechanisms and in what range the mechanisms can be provided jointly in the region?

The first restriction, already mentioned, is laying the focus on SMEs. Further, the study aims to define the whole picture of what can and should be done to implement the system. Thus, partly based on this research are defined plans of the projects for future implementation. However, these individual plans are not described in this study.

1.2 Research Method

Considering the research objectives, the case study method was selected to be the most appropriate research strategy. As Yin (1994) defines, a case study is an empirical inquiry that investigates a current phenomenon within its real-life context, especially

when the boundaries between phenomenon and context are not clearly evident. This description is thoroughly valid in the setting of this study. One further characteristic of the case study inquiry is that it benefits from the prior development of theoretical propositions to guide data collection and analysis (Yin, 1994). However, no hypotheses or other proposals were formed after the theoretical review, since the aim of the study is to interpret, and not to test or confirm predetermined propositions.

The preferred process of data collection for case studies is called theoretical sampling (Eisenhardt, 1989). In theoretical sampling, the analyst jointly collects codes and analyzes the data, and decides what data to collect next and where to find it, in order to develop theory as it emerges (Glaser and Strauss, 1967). Half-structured theme interviews were the primary data collection method for this study. This type of interview allows flexibly adapting of the predetermined questions to the situation, and the interviewees are not tied to any alternative answers, but are free to express themselves with their own words (Hirsjärvi and Hurme, 2001). Half-structured interviews enable taking into account that it is essential how individuals interpret things, and what kind of meanings they give to things (Hirsjärvi and Hurme, 2001). The survey was conducted through three different techniques: phone interviews, face to face interviews and email survey. This was the most effective way to collect the data from the all respondents. All together the number of the survey respondents was 24. In addition, a few other phone interviews were made.

The analysis of the data consists of three concurrent flows of activity: data reduction, data display, and conclusion drawing. Data reduction is the process of selecting, focusing, simplifying, abstracting, and transforming the data. The second major flow of analysis activity is data display which basically means an organised, compressed assembly of information that permits conclusion drawing and action. The creation and use of displays is not separate from analysis but it is a part of analysis. The third stream of analysis activity is conclusion drawing and verification. (Miles and Huberman, 1994)

1.3 Structure of the Thesis

The study starts with a theory part which creates the bases for the empirical study. The first step is to define and describe the innovation itself (figure 1). In chapter 3 and 4 are formed the bases for a theoretical framework for cross-border innovation support platform. This starts with an introduction of open innovation paradigm and continues by distinguishing innovation management at the system level. Finally, in the chapter 5 a framework for this model is created.

Chapter 6 consists of a short introduction of the case environment. Further, in the empirical part the prevailing circumstances are pieced together by a survey and some individual interviewees. In chapters 7 and 8 these results are interpreted and based on the theory a sustainable platform is built to support innovations in the region. In the end, the conclusions of the study are made.

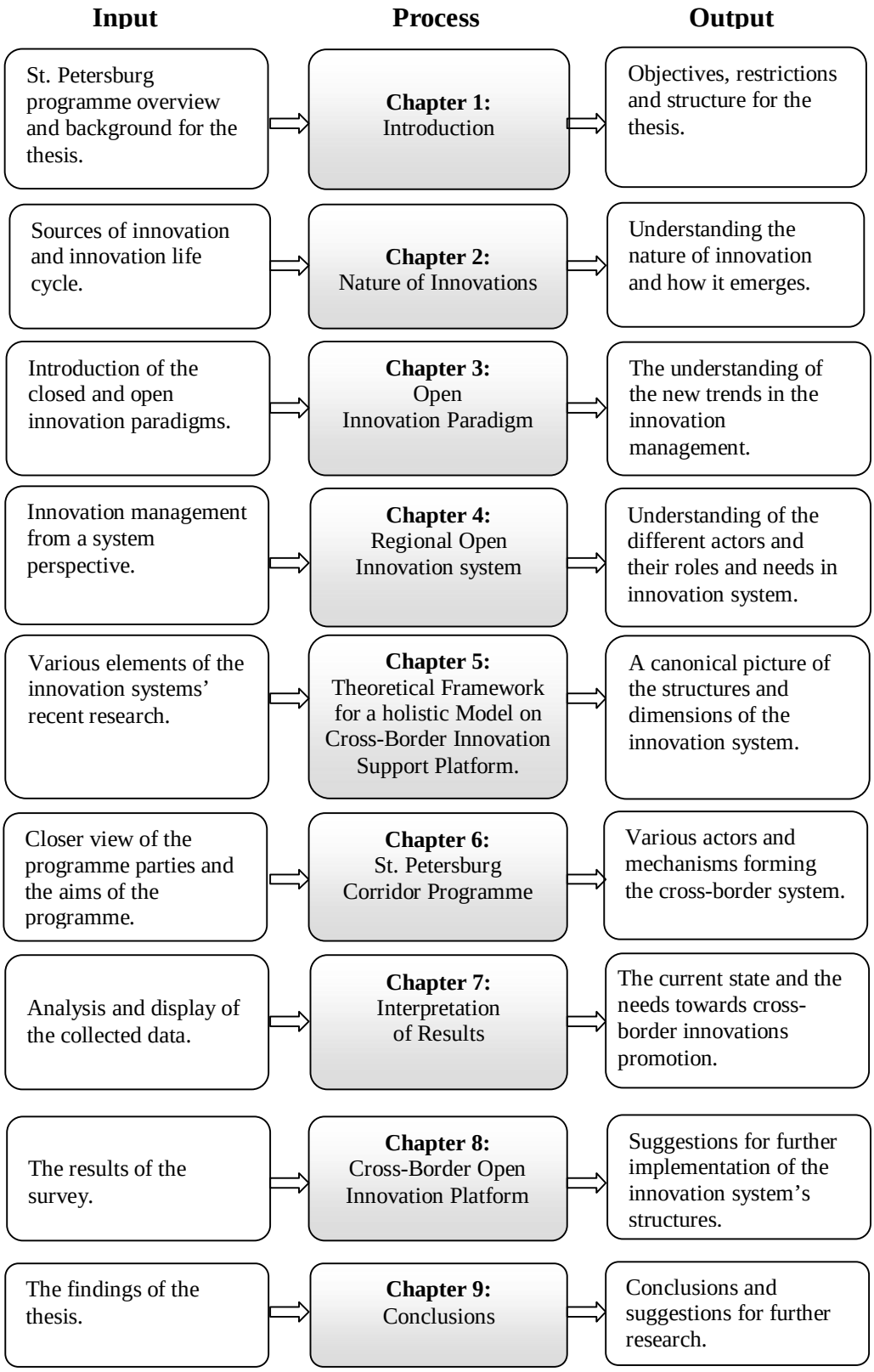

Figure 1. The structure of the thesis

2 NATURE OF INNOVATIONS

Innovation is often connected to creativity. Even sometimes, the meanings of these two words are mixed. Holt (2008) suggested that creativity is the ability to bring something new into existence. Innovation, on the other hand, is the process of doing new things. Thus, innovation is the transformation of the creative ideas into practical applications, but creativity is a prerequisite to innovation.

Innovation starts with the generation of new ideas. An idea is something imagined or pictured in the mind. Ideas have little value before they are converted into new products, services, or processes. After a practical implementation of an idea into a new device or process it can be called innovation. (Schilling, 2006, p.16) Innovation can be a new product or a service, a new production process technology, a new structure or administrative system, or a new plan, or a program pertaining to organizational members (Daft, 1986). An innovation is a new idea, which may be a recombination of old ideas, a scheme that questions and challenges the present order, a formula, or a unique approach which is perceived as new by the individuals involved (Zaltman et al. 1984; Rogers, 1995). According to Van de Ven (2008) "*As long as the idea is perceived as new to the people involved, it is an "innovation," even though it may be appear to others to be an "imitation" of something that exits elsewhere*". In general, innovation is usually seen as a conducive thing because the new idea must be useful, profitable, constructive, or solution to a problem (Van de Ven, 2008). Thus, the markets usually guarantee that good innovations will be adopted.

Innovations can further create larger entities, such as two separate innovations used together or applications to utilise various innovations. These entities are understood as technologies. Christensen and Raynor (2003, p. 39) define technology as, ''*the process that any company uses to convert inputs of labor, materials, capital, energy, and information into outputs of greater value. For the purposes of predictably creating growth, treating 'high tech' as different from 'low tech' is not the right way to categorize the world. Every company has technology, and each is subject to these fundamental forces.*'' Burgelman et al. (2004, p. 2) define technology as, ''*the*

theoretical and practical knowledge, skills, and artefacts that can be used to develop products and services, as well as their production and delivery systems. Technologies can be embodied in people, materials, cognitive and physical processes, plant, equipment and tools. Key elements of technology may be implicit, existing only in an embedded form (like trade secrets based on know how) and may have a large tacit component.''

2.1 Classification of Innovation

The type of innovation may be classified at least into two different categories. The first is to discuss innovations as technical or administrative ones (Damanpour and Evan, 1984; Daft and Becker, 1978). The second category distinguishes innovations into incremental and radical ones based on the newness of the innovation (Zaltman et al., 1984). Technical innovations are linked to the basic work activity of the organization. They can be product, service or production process innovations. Administrative innovations, instead, are indirectly related to the basic work activities of the organization and more directly related to its management. Thus, they involve e.g. organizational structure and administrative processes. (Damanpour and Evan, 1984)

Incremental innovations are minor improvements or simple adjustments in current technology, and radical innovations are described as fundamental changes that represent revolutionary changes in technology. The more an innovation differs from existing alternatives, the higher is its degree of radicalness. (Zaltman et al., 1984)

2.2 Characteristics of Innovation

The first categories of innovation characteristics affecting adoption were studied by Rogers (1995). These characteristics were following:

- relative advantage
- compatibility
- complexity
- trialability
- observability.

Frambach and Schillewaert (2002) situated that perceived innovation characteristics drive the adoption process and are influenced by external variables like the potential adopter's environment and supplier of the innovation. The perceptions of an innovation by an organisation or a customer affect their evaluation of and propensity to adopt a new product. The perceived benefits should exceed the alternatives if innovation is considered to be adopted.

It is practical to distinguish between the primary and secondary attributes of an innovation. Primary attributes, such as size and cost, are invariant and natural to a specific innovation irrespective of the adopter. Secondary attributes, such as relative advantage and compatibility, may differ from adopter, being contingent upon the perceptions and context of adopters. (Tidd et al., 2005, p. 271) Next, these characteristics will be further distinguished.

2.2.1 Relative advantage

Relative advantage is the degree to which an innovation is perceived as superior to the product it supersedes, or competing products. Relative advantage is typically measured in narrow economic terms, like cost or financial payback. However, non-economic factors such as convenience, satisfaction and social prestige may be equally important.

Generally, the greater the perceived advantage is, the faster the rate of adoption will be. (Tidd et al., 2005, p. 271)

Incentives can be used to promote the adoption of an innovation, by increasing the perceived relative advantage of the innovation, subsidizing trials or reducing the cost of incompatibilities. (Tidd et al., 2005, p. 271)

2.2.2 Compatibility

Compatibility is the degree to which an innovation is perceived to be coherent with the existing values, experience and needs of potential adopters. Two distinct aspects of compatibility can be distinguished: existing skills and practices; and values and norms. The extent to which the innovation fits the existing skills, equipment, procedures and performance criteria of the potential adopter is important, and reasonably easy to access. (Tidd et al., 2005, p. 271)

According to Tidd et al. (2005) so-called “network externalities” can affect the adoption process. For example, the cost of adoption and use, as distinct from the cost of purchase, may be influenced by the availability of information about the technology from other users. This can include e.g. information of trained skilled users, technical assistance and maintenance, and of complementary innovations, both technical and organizational. (Tidd et al., 2005, p. 271)

Leonard-Barton and Sinha (1993) established that compatibility with existing practices can be less important than the fit with existing values and norms. Significant misalliances between an innovation and an adopting organization will require changes in the innovation or organization, or both. Thus, mutual adaptation of the innovation and organization is needed.

2.2.3 Complexity

Complexity is the degree to which an innovation is perceived as being complicated to understand or use. In general, innovations which are simpler for potential users to understand will be adopted more rapidly than those which involve the adopter to develop new skills and knowledge. (Tidd et al., 2005, p. 272)

2.2.4 Trialability

Trialability is the degree to which an innovation can be tried out with on a limited basis. An innovation that can be trialled represents less uncertainty to potential adopters, and allows learning by doing. Innovations which can be trialled will generally be adopted more quickly than those which cannot. Though, the exception is where the undesirable consequences of an innovation appear to outweigh the desirable characteristics. In general, adopters wish to benefit from the functional effects of an innovation, but they avoid any dysfunctional effects. Hence, where it is difficult or not possible to separate the desirable consequences trialability may reduce the rate of adoption. (Tidd et al., 2005, p. 272)

2.2.5 Observability

Observability is the degree to which the results of an innovation are visible to others (Rogers, 1995). The easier it is for others to see the advantages of an innovation, the more likely it will be adopted. (Tidd et al., 2005, p. 272)

2.3 The Sources of Innovations

Innovation can originate from many different sources. It can come from individuals as well from the research efforts of universities, government laboratories, incubator, or private nonprofit organizations. Of course, one primary engine of innovation is firms (Schilling, 2006, p. 16). von Hippel (1988) distinguishes such basic sources of innovation as users, manufacturers and suppliers as innovators. The functional source applies from categorizing firms and individuals in terms of the functional releationship through which they derive benefit from a given product, process, or service innovation. For instance, the manufacturer as innovator benefits from manufacturing the innovation and the user as innovator benefits from using the innovation. These functional sources offer a significant framework for industrial approach, despite this, innovation should be seen to originate from several several sources.

Even non-official meetings between friends may prove to be much more creative than regular brainstorming inside the company's R&D facilities. Innovations may already exist somewhere they just need to be found. By bridging different, non-obvious, sources or creating new communities companies may end up finding ideas that otherwise had never came up with. (Hargadon, 2003)

As Schilling (2006) situated, even stronger initiative of innovation, than the any individual source, are the linkages between the sources. Networks of innovators that leverage knowledge and other resources from multiple sources are one of the most powerful driving forces of the technological advance (Schilling, 2006; Rothwell, 1972; Smith-Doerr et al., 1999). Hence, the sources of innovation can be thought as composing complex system wherein any particular innovation may emerge primarily from one or more components of the system or the linkages between them (Schilling, 2006, p. 16). The figure 2 illustrates this elaborate system.

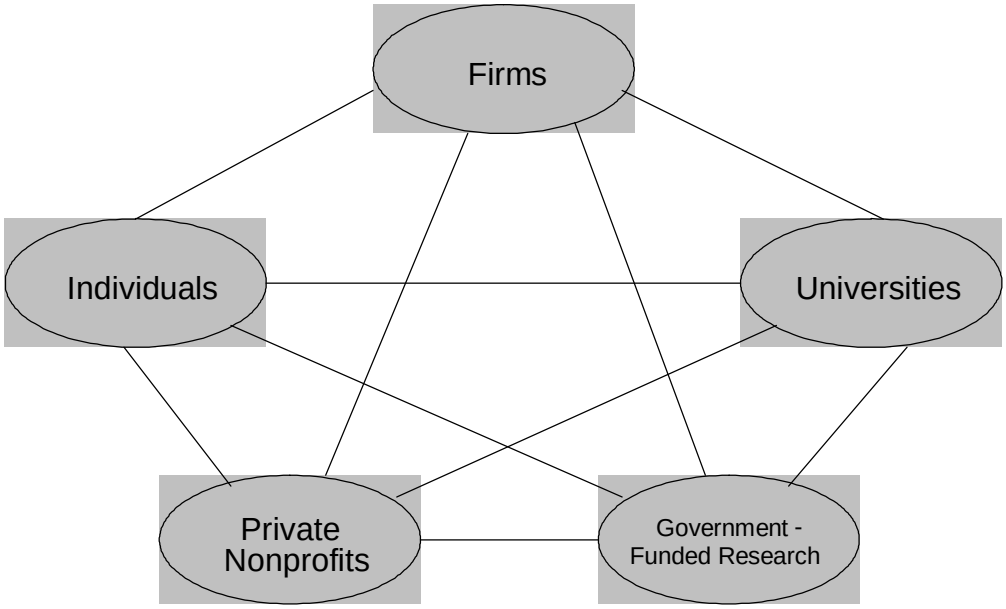

Figure 2. Sources of Innovations as a System (Schilling, 2006, p. 16).

Hence, to increase the emerging of innovations more attention must be paid on the several various sources and the complex networks between. Substantially, it is not always clear who is the innovator and who owns the innovation. When the innovation arises from a network, several organisations can share the role of innovator. Understanding the importance of networks as innovation sources has as well directed the recent research of innovation process (Rothwell, 1992; Yaklef, 2006).

Further, innovation networks may direct their focus on narrower area of technologies and competencies. As consequence, these networks start building their core competencies based on the defined focus, in other words forming *clusters*. Porter (2003) defines a cluster as a geographically proximate group of interconnected companies, suppliers, service providers and associated institutions in a particular field, linked by externalities of various types.

2.4 Innovation process

Managing innovation can be seen as a multi-complex process. Rothwell (1992) has examined five generations of innovation models. The first models to understand and distinguish different phases of innovation process were studied at 1960s. These implemented linear "technology push" and "need pull" thinking, situating the opportunities to take research results to the markets and on the other hand pointing the research dilemmas that originated from market needs. During ensuing decades further generations were examined. In early 1970s a "coupling model" was introduced. This recognized that interaction between different elements and feedback loops is needed in practice of innovation (Freeman and Soete, 1997; von Hippel, 1988). In the 1980s an observed "integrated" model indicated that R&D management was integrated with other operations of the company, like marketing (Rothwell, 1992). The fourth generation innovation process, marked a shift from perceptions of innovation as a strictly sequential process to innovation perceived as a largely parallel process. Recent developments signify the possibilities attainable in the proposed "strategic integration and networking" model, elements of which are already in place. According to this fifth generation model, innovation is becoming faster; it increasingly involves inter-company networking; and it employs new electronic toolkits. (Rothwell, 1992)

During the 1990s Stage-gate –models in product development process were adopted and portfolio thinking was emphasized in managing R&D projects. Those divided the innovation process in several evaluation stages that each stage estimated the further potential of the development. In some cases when the development of product discontinued it evaluated to wait for later estimation. This way some products would have been further developed after the conditions turned more favourable. (Cooper, 1990; Cooper et al., 2001)

Yaklef (2006) examines that future innovation process will emphasize both internal R&D deployment of the company and at the same time more open and collaborative practices. In other words, companies will need to have internal R&D to maintenance their absorptive capacity. In this context the absorptive capacity means the firm’s ability

to understand and be able to utilize various technologies coming outside the firm's boundaries.

2.5 Innovation Diffusion

As the innovation eventually reaches the stage when it will be close to commercialization, the diffusion of innovation becomes increasingly relevant. This topic is widely studied (e.g. Bass, 1969; Rogers, 1995; Geroski, 2000) to understand how to gain the most advantage of the innovation in the markets. However, not all the innovations that enter the market are diffused at the same speed (Martinez et al., 1998) nor at the same way (Chesbrough, 2003a).

Tidd et al. (2005) stated that in practice the precise pattern of adoption of an innovation will depend on the interaction of demand-side and supply-side factors. The choice between the models will depend on the characteristics of the innovation and nature of potential adopters.

"S-Curve of Innovation Diffusion" and "Adoption of Innovations" are some of the best known models to describe the diffusion process. The S-Curve explains how fast innovation will be adopted after an initial base of users has been established. Adoption of Innovations instead states the different categories of innovation adopters and huge part is adopted by each category. The first 2.5 percent of the adopters are innovators, in this context the innovators applies a user who is first to use the innovation. The 13.5 percent is covered by early adopters. Portion of early majority is 34 percent as well as the portion of late majority. The latest ones to adopt are laggards that cover 16 percent (Rogers, 1995). Adoption curve essentially obeys a normal curve of distribution. Figure 3 combines these both curves.

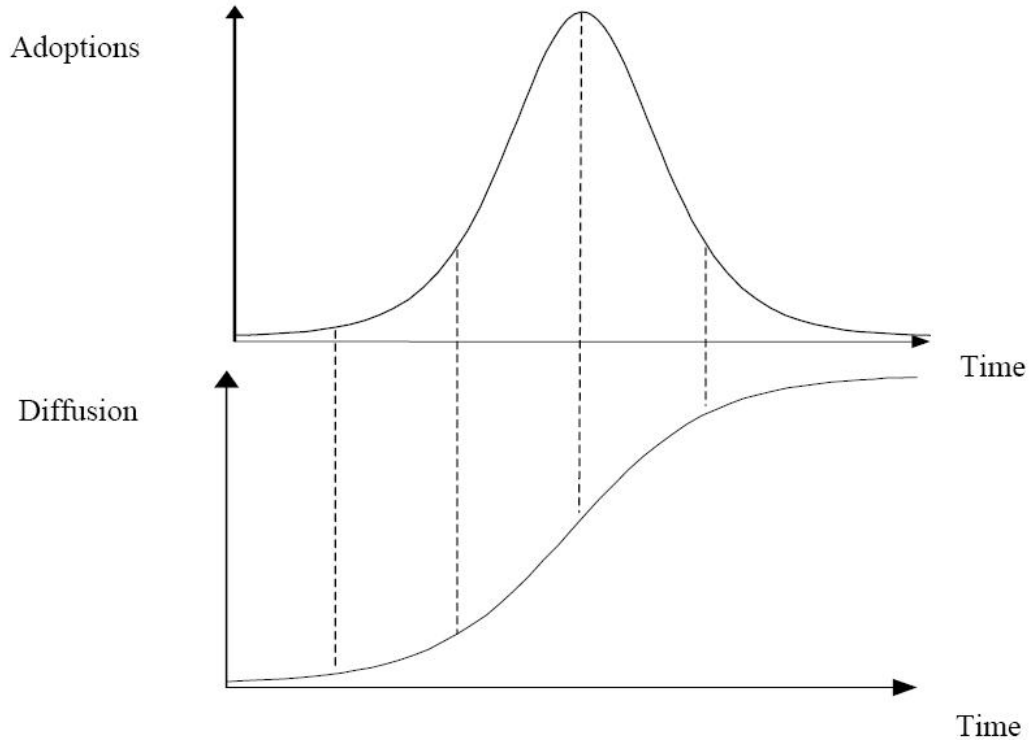

Figure 3. Combination of Innovation Diffusion and Adoption.
(adapted from Rogers, 1995)

It is considerable to note that innovation may be adopted on one markets, however, somewhere else may be holding other markets that have unsatisfied demand. Ansoff suggests this as a market penetration, moving an existing innovation or a product to the new markets (Ansoff, 1957).

In this chapter the basic understanding of innovation was introduced and some characteristics of it. The next step is to study the innovation process more deeply and how it is organised in the recent studies. Hence, the next chapter will discuss the open innovation paradigm that is concentrated on opening the innovation process.

3 OPEN INNOVATION PARADIGM

According to Maula, Keil, Salmenkaita (2006) innovations are increasingly systemic. Hereby, companies become more and more dependent on external parties and the resource allocation equation changes because a majority of the potential relevant resources are located outside the boundaries of the corporation. This includes using all the more such activities as e.g. networking, alliances, collaborating, and on the other hand acquiring of technologies e.g. in a form of licensing, merges and acquisitions as well. Finally, resulting of this increasing trend of need for openness Chesbrough (2003a) introduced the term “Open Innovation Paradigm”. It contains a set of practices, however, it still leaves several open questions how to implement the model effectively and dynamically. To understand better the idea of this theory, first, is compared the models of closed and open innovation.

3.1 Closed Innovation Model

Even though companies realized the importance of flexibility and networking in R&D-operations, they kept their processes as a highly protected, secret business that was carried out all the way from beginning to end inside the company. In figure 4 is presented the traditional process of R&D projects.

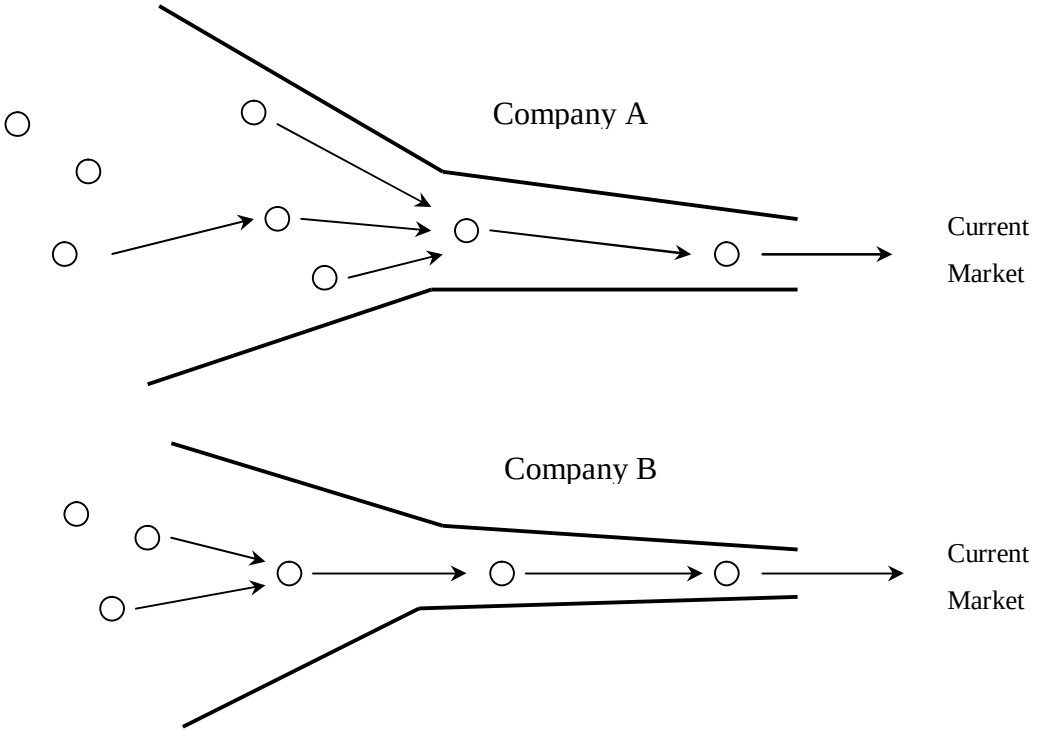

Figure 4. The Knowledge Landscape in Closed Innovation. (Chesbrough, 2003a)

This traditional model is also known as a closed innovation model because the whole innovation process from an idea to product launching takes place inside the company (Chesbrough, 2003a). The technologies and innovations created by others can not be trusted ("Not Invented Here" – syndrome) and on the other hand other comers don't want to be benefiting from own ideas even though there wouldn't exist any reasonable way to commercialize innovation through own market channels ("Not Sold Here" – virus) (Katz and Allen, 1982). The traditional model may have fit well in the business environment of the last century when vertically integrated companies believed they were successfully able to recruit the most talented workers. Even in this day, model goes well with some industries, like nuclear power and war industries where control is in a critical position. (Gassmann, 2006)

3.2 Open Innovation Model

However, today's rapidly changing business environment, where the significance of information and competence is emphasized, life cycles of products and technologies are

shortened and rivalry increases, is forcing companies to look for new innovation models to strengthen their operations. An open innovation paradigm assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to markets, as the firms look to advance their technology. (Chesbrough, 2003a) The suggested model of Open Innovation is offered in figure 5.

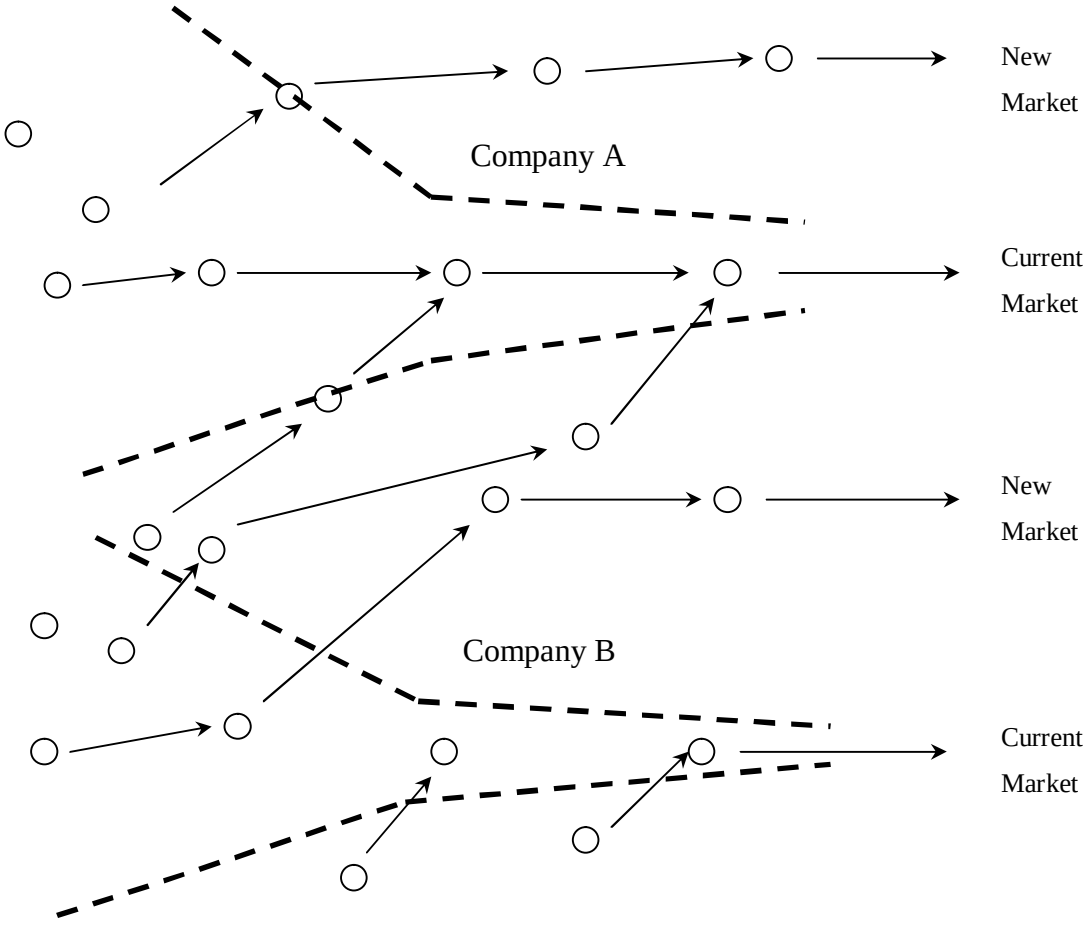

Figure 5. The Knowledge Landscape in the Open Innovation Paradigm. (Chesbrough, 2003a)

The model combines both internal and external ideas into architectures and systems whose requirements are defined by a business model (Chesbrough, 2003a). Companies should make much greater use of external ideas and technologies in their own business, while letting their unused ideas be used by the other companies. This requires each company to open up its business model to let more external ideas and technologies flow in from the outside and allow more internal knowledge flow to the outside. (Chesbrough,

2006a) In table 1 is listed the basic principles of both closed and open models to recognize difference between these two models.

Table 1. Contrasting principles of Closed and Open Innovation.
(Chesbrough, 2003b)

Closed Innovation Principles:	Open Innovation Principles:
The smart people in our field work for us.	Not all of the smart people work for us so we must find and tap into the knowledge and expertise of bright individuals outside our company.
To profit from R&D, we must discover, develop and ship it ourselves.	External R&D can create significant value; internal R&D is needed to claim some portion of that value.
If we discover it ourselves, we will get it to market first.	We don't have to originate the research in order to profit from it.
If we are the first to commercialize an innovation, we will win.	Building a better business model is better than getting to market first.
If we create the most and best ideas in the industry, we will win.	If we make the best use of internal and external ideas, we will win.
We should control our intellectual property (IP) so that our competitors don't profit from our ideas.	We should profit from other's use of our IP, and we should buy other's IP whenever it advances our own business model.

As Chesbrough (2006b) sums up open innovation is both a set of practices for profiting from innovation, and also a cognitive model for creating, interpreting and researching these practices. It offers guideline to perceive the prevailing innovation landscape.

3.3 The Role of Intellectual Property and exploiting it

Hence, the paradigm of open innovation places around ideas, innovations and technologies and taking higher advantage of those. By recognizing the benefits of this open concept the companies are able to make more profits with their intellectual property (IP).

There is a range of intellectual property rights (IPR) that can be used to exploit technology. IP encompasses patents, copyrights, trade secrets, trademarks, etc. IP might serve as a trigger for a new innovation, but it is not a prerequisite for an innovation to be born. According to Chesbrough (2003a) intellectual property refers to the subset of ideas that (1) are novel, (2) are useful, (3) have been reduced to practice in a tangible form, and (4) have been managed according to the law. Naturally, not all the ideas are protectable as IP, and many ideas that could be protected are not protected (Figure 6).

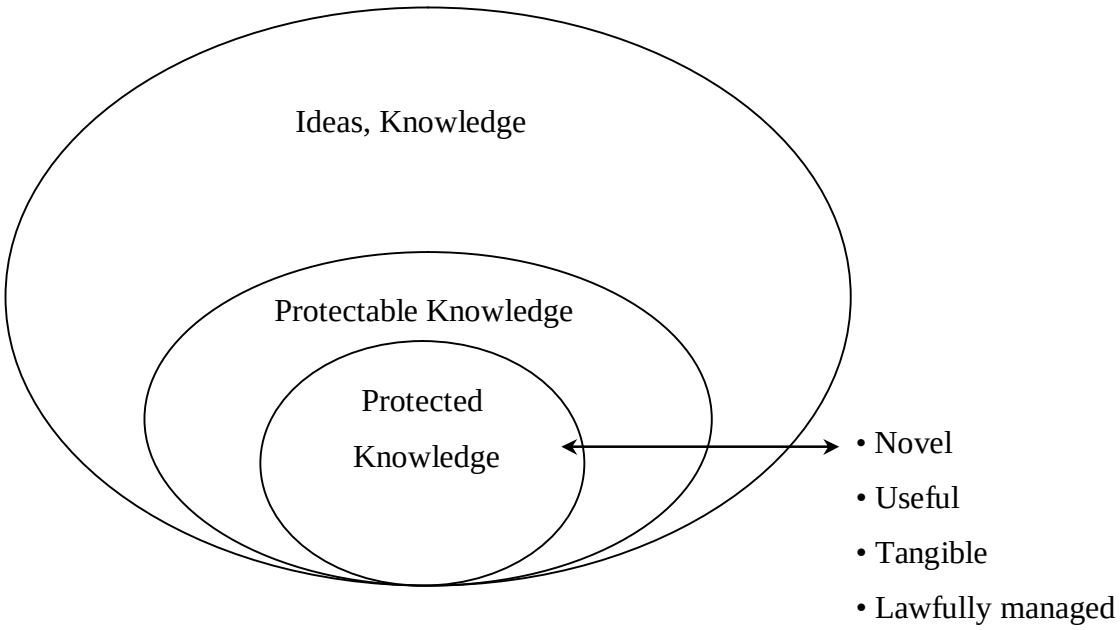

Figure 6. Ideas and Intellectual Property. (Chesbrough, 2003a, 157)

Patents can be seen as the leading source of trade in IP, and many of the issues in managing patents will also apply to the management of other types of IP. By some measures the market for patents and licenses is enormous, for example in 2000 the worldwide patents and licensing markets accounted $142 billion global royalty receipts. However, though the market for this exchange has been huge, the majority of exchange occurs between affiliates of the same firm operating in different countries, rather than in the open market. (Chesbrough, 2003a, p. 157)

The most obvious way to utilize the intellectual property is the current company. However, as prior made clear alternative output channels exist as well. One plan of action is spin-off that means a new organization or entity formed by a split from a larger one. Other alternative is to give IPR to external parties through licensing or transferring a whole technology. Among others using joint ventures is one approach. The table 2 presents the alternative ways to utilise intellectual property.

Table 2. Alternative outputs of intellectual property

Inside	Outside
Current Company	Spin-off
	Licensing
	Technology transfer
	Joint Ventures

From the perspective of open innovation the exploiting of IP can be seen as a tremendous option to make some extra profits not forgetting several other advantages. Tidd et al. (2005) distinguished some benefits that can be achieved by licensing IPR:

- Ø Reduce or eliminate production and distribution costs and risks
- Ø Reach a larger market
- Ø Exploit in other application
- Ø Establish standards
- Ø Gain access to complementary technology
- Ø Block competing developments
- Ø Convert competitor into defender.

Thus, by establishing a good IPR-strategy can be achieved several advantages, such wider exist of own technologies. Even weakening a competitor's position is possible by blocking its technologies if the rights are owned by you. This list can be complemented with higher utilization of own R&D results. For instance, Viskari (2006) studied a framework for companies to create a portfolio for non-core technologies that could be utilized as a searching engine, an idea bank, a communication tool or a market place for technologies.

Thus, exploitation of IPR has become increasingly growing trend. There exists several various licensing strategies and no best licensing is argued. Differences may occur e.g. in pricing, searching and entering the markets methods. The successful exploitation process also incurs costs and risks (Tidd et al., 2005, p. 263):

- Cost of research, registration and renewal
- Need to register in various national markets
- Full and public disclosure of your idea
- Need to be able to enforce.

Exploiting of IPR may offer several opportunities to improve the business. In general, it is not any new phenomenon. However, according to open innovation whole new aspects can be discovered. The next section argues how IPR can be assigned through a third party and what advantages and disadvantages are carried out in this process.

3.4 Innovation Intermediaries

Companies may not be always willing to put efforts to conduct the mechanisms of open innovation. In addition, some firms don't even have enough resources to search for technologies systematically or alternatively search for ways of optional exploiting channels for IPR. This creates an opportunity for such a services offered by the third party.

Thus, recently has organized a group of companies that have focused their own business on helping companies implement various aspects of open innovation. According to different sources these can be called either innovation intermediaries (Chesbrough, 2006a, p. 139) or technology brokers (Törrö, 2007). These companies are creating secondary markets for innovations like financial institutes did e.g. for the stocks and bonds. These firms enable other companies to explore the market for ideas without getting in over their heads. Intermediaries act as guides to help the other companies along the trail. These companies implement, naturally, various business models. Some

are concentrated on search of innovations for special needs of other companies and some are more likely to operate in the field where innovations need customers, some one to utilize and to commercialize it. (Chesbrough, 2006a) In addition, intermediaries may have various roles according to the level of their expertise service. Some may just carry out the exchange process where as other intermediaries are consulting both the supplier and the buyer sides. According to Törrö (2007) the scope of intellectual capital brokering should not be limited to marketing actual IP, but mediating all kinds of ideas, knowledge and competences.

Törrö (2007) illustrated a theoretical framework for a global intellectual capital brokering. The broker acts as an intermediary changing the intellectual capital and rewards between the provider and buyer. The adapted model is presented in figure 7.

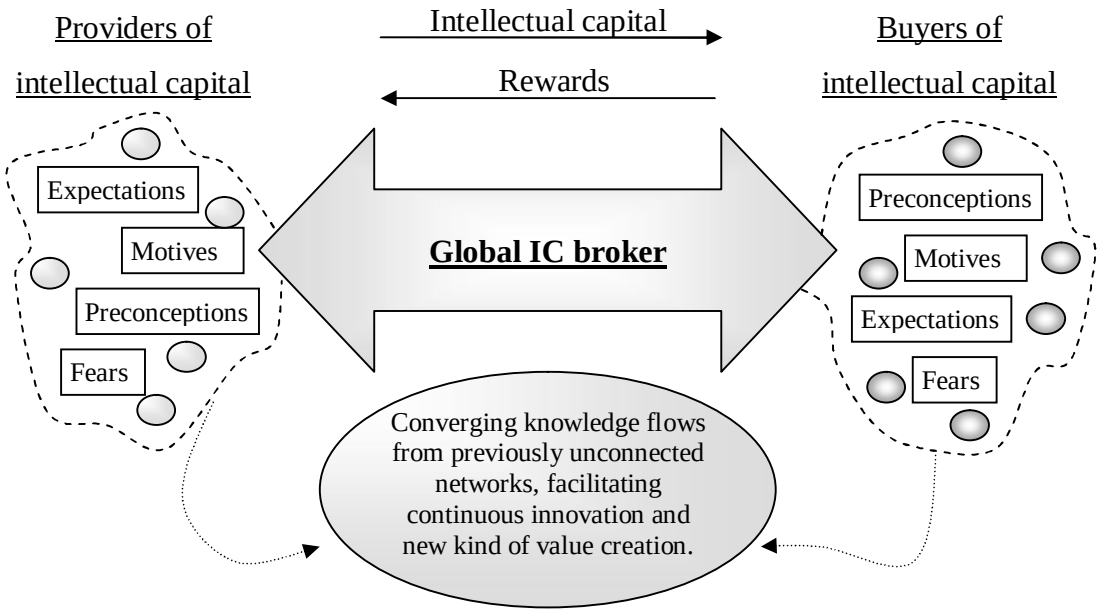

Figure 7. A theoretical framework for a global intellectual capital brokering (adapted from Törrö, 2007)

Innovation brokers offer benefits like outsourcing innovation function and searching of innovation. Both end parties of the process, providers and buyers, have expectations,

motives, preconceptions and fears towards the brokering. These factors have to be faced properly to establish a trusted and recognized intermediary.

Naturally, these kinds of challenges occur, like in the all new businesses that have not yet set up on the stabilized markets. Hence, it is too early to speak of “best practices”, as each organisation is experimenting with how best to serve this new market area. These intermediaries are trying to solve the open innovation’s challenges of utilisation the external sources. Chesbrough (2006a) listed the challenges as following:

- Managing and protecting identity
- Managing contamination risk
- Identifying useful, non-obvious sources
- Fostering a two-sided market
- Scaling efficiently with volume.

Other approach is to see the brokering as a matter of trust. Of course, some of the challenges identified by Chesbrough apply to paradigm of trust as well. Some companies have managed the identity problem by buffering through trusted intermediaries (TIs). The TI is an employee of the broker company, but his or her role is to work as a part of the member company’s inside business development, research, or commercialization team. TIs sign agreements with the broker company that prevent them from owning or holding any IP rights in any of the work that they do, making them true intermediaries. The TIs sign as well strict confidentiality agreements to protect the knowledge of the member companies with which they work. (Chesbrough, 2006a)

Though, Ford et al. (1998) argued that intellectual capital brokers cannot provide the aspects of trust and commitment that would develop in a long-term relationship between a solution provider and a company customer. However, besides brokering, organizations providing intermediation functions have been covering more traditional contract research and technical services (Howells, 2006) which relates to better managing and protection of identity. In addition, partners in collaboration, in some cases at the international level, may come from asymmetric trust contexts, they bring with them

different motivations and expectations of behaviour. For example, partnership of big and small enterprise creates a precondition that other partner is stronger and it may try to utilize this advantage unfairly. Specifically, the companies may be more or less willing to invest in trust-building and in other governance mechanisms. (Zaheer and Zaheer, 2006) Hence, the trusted intermediary could offer symmetric prerequisites for the partners that otherwise would suffer from various risks related to trust.

For managing contamination risk the companies have found various ways. Some of them are stricter, such as procedure where seeker sees only valid solutions (Chesbrough; 2006a). By showing only the valid solutions the use of non-obvious sources may not be established efficiently. This positions more expectations on the broker's expertise of matchmaking. To provide using of non-obvious sources one company holds thousands of solvers in many countries and has numerous and diverse e-mail lists. Still it seems that as companies are conducting diverse ways to create value they are not able to correspond to all the challenges at the same time, at least not equitably. Thus, it can be seen that some companies concentrate only on conducting one-sided market and some are constrained by market focus.

Virtual environment

Verona et al. (2006) examined that a brokering position becomes even more beneficial in a virtual environment. In addition, the companies studied by Chesbrough (2006a) had also emphasized virtual tools, such as the Internet. Electronic databases in different forms and emails played crucial role in their business environment. Verona et al. (2006) discussed how virtual environments substantially strengthen the competences of a knowledge broker. They divided the advantages into two phases in the brokering cycle, firstly network access, and secondly knowledge absorption, integration, and implementation. These beneficial factors are listed in Table 3.

Table 3. The impact of virtual environments on a knowledge broker's distinctive competences. (Törrö, 2007)

Brokering cycle	Specific dimenison	Impact of virtual environments
Network access	*Direct ties*	Low-cost and easy-to-use platform Elimination of geographic barriers Blurring up of the trade-off between richness and reach Network externalities
	Indirect ties	Open standard allowing entry to partners' partner competences
	Structural autonomy	Syndication Convergence among unrelated skills Opportunities for sharing innovative labor
	Tie modality	Real-time, two-way, low-cost communication Low costs of conversion of the platform of interaction
Knowledge absorption, integration and implementation	*Knowledge absorption*	Tools enhancing knowledge acquisition from individuals – online tracking; surveys and pools; user-friendly toolkits for product configuration Communities of creation
	Knowledge integration	Formal mechanisms increasing information distribution Informal social integration through extended connectivity Communities of practice facilitating assimilation through distributed learning
	Knowledge implementation	Information digitalization increasing the inputs for knowledge transformation Electronic archives facilitating knowledge retrieval and recombination Availability of the same knowledge to more potential users

Table 3 plainly indicates that brokering position becomes even more beneficial in a virtual environment. However, all these impacts may not be implemented in every case because of different roles, business models and operating environments of the brokers. In addition, Kalakota and Konsynski (2000) argued, customers will demand at least the same levels of trust and integrity in the networked world as they expect of the customary off-line system. Thus, the same confidentiality issues can be recognized when operating virtually. Furthermore, the basic IT-security threats are involved.

This chapter discussed the current trend on the innovation landscape. The increasing need for opening up the innovation processes was examined and some mechanisms related to it. Next will be argued how this open model theme can be applied at the system level.

4 REGIONAL OPEN INNOVATION SYSTEM

So far, studies of open innovation have included mainly large, multinational American companies (West et al., 2006). However, companies operate at diverse levels: local, national and international. Additionally, the operating companies may vary in their size. Open innovation presumes that knowledge flows between firms, and the channels are interorganizational networks, constituted from a diverse range of possible ties. Therefore, in order to understand open innovation, the network context in which firms operate, has to be understood. As Vanhaverbeke and Cloodt (2006) suggest, a network perspective is required as a complementary approach of open innovation.

Regions have been recognized as playing a central role in the European economy and are gradually becoming basic units of economy (De Bruijn and Legendijk, 2005). Hence, the recent studies have narrowed the basis of innovative companies from a national stage to the regional level (Chung, 2002; Gerstlberger, 2004; Cooke, 1998a).

This chapter examines the innovation system at the regional level from the perspective of open innovation. The chapter also aims to offer a cultural perspective because the intention is to create a cross-border model that includes cultural influence as well. Further emphasis is placed on small and medium-sized companies as those are seen in a central role in the European economy (European Commission, 2006).

4.1 Regional Innovation System

As already argued innovation arises from several different sources and especially from the networks and linkages between those sources. These networks can be called innovation system (Schilling, 2006). Emergence of the concept of regional innovation systems in early 1990s (Cooke, 1992) was fairly driven by putting together research of some key elements as the existence of regionalized technology complexes (Saxenian, 1994) and large-scale “technopolis” arrangements (Castells and Hall, 1994; Scott, 1994), that were previously researched independently. Linking together business networking,

technology transfer and vocational training provided the key pillars for the “systems house” of regional innovation (Körfer and Latniak, 1994). Cooke (1998b) argued that the innovative regional cluster will consist of firms, large and small, comprising an industry sector in which network relationships exist or can be commercially foreseen, research and higher education institutes, private R&D laboratories, technology transfer agencies, chambers of commerce, business associations, vocational training organizations, relevant government agencies and appropriate government departments. This forms an integrative governance arrangement.

Torkkeli et al. (2007) studied integration of an open innovation model and innovation system at the regional level, particularly from the perspective of small and medium-sized companies. This integration produces a platform for co-operational and open innovation development which they called regional open innovation system.

4.2 Triple helix and regional open innovation system

In recent years a number of concepts have been proposed for modelling the transformation processes in university-industry-government relations (Leydesdorff and Etzkowitz, 1998). The Triple Helix model tries to explain a new configuration of the emerging institutional forces at the heart of innovation systems, through either the total decline of the State, or the opening of a traditionally closed firm to its external environment (Marques et al., 2006, p. 535). In addition, the model groups reasonably the factors that innovative regional cluster consists of. The Triple Helix model is presented in the figure 8.

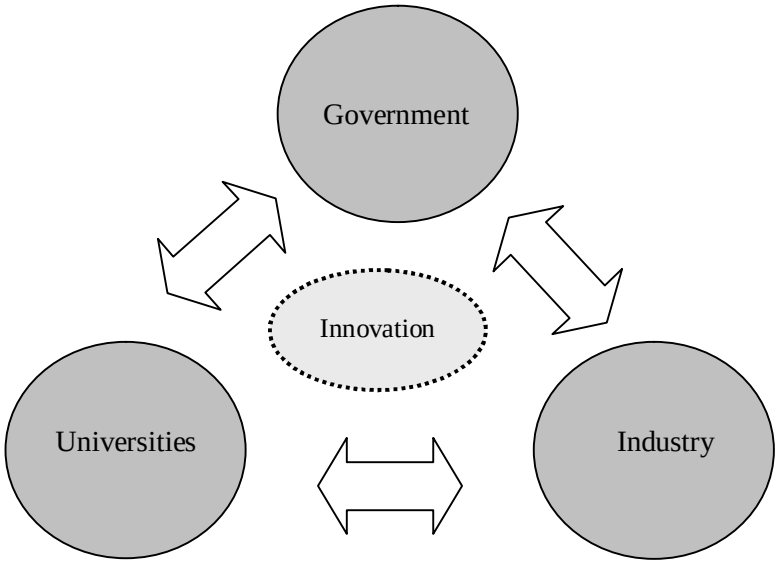

Figure 8. Triple helix –model (Adapted from Saad and Zawdie, 2005, p. 95)

At least three main forms of the Triple Helix model are identified. In Triple I Helix these three spheres are defined institutionally. Interaction across boundaries is mediated by organisations such as industrial liaison and technology transfer centres. In Triple Helix II the helices are defined as different communication systems. The interfaces among these diverse functions operate in a distributed mode that produces potentially new forms of communication. In Triple Helix III institutional spheres of three phases perform not only their traditional functions but assume the roles of the others (Leydesdorff and Etzkowitz, 1998, pp. 197-198).

4.3 Cultural Influence on Innovation System

Further, as the system and the markets achieve an international context several other factors must be taken notice. When two or more cultures are mixed a possibility of cultural challenges to arise may exist. Many radical innovations may be created in cross-cultural environment. Also, Differences between cultures result various behaviour at the adoption of innovation (Haapaniemi, 2006).

Business models used in Western markets may not be applicable to emerging markets because of cultural differences (Nilsson, 2007). Companies must be able to cope with the cultural heterogeneity across different international markets. Secondly, companies may identify and exploit new opportunities in foreign cultural contexts in expectation of long-lasting competitive advantages. (Langhoff, 1977, p. 159) The analysis of the cultural environment in international business environment is assisted with the help of anthropological, sociological and psychological frameworks (Bradley, 2002, p. 87).

Culture is a complex concept that includes specific knowledge, beliefs, morals, laws and customs shared by a society. The society is not always limited into one specific region, and on the other hand in one region may exist various cultures. Culture is so pervasive yet complex that it is complicated to define and each researcher seems to have a separate definition. (Bradley, 2002) Terpstra (1978) examined culture to include conscious and unconscious values, ideas, attitudes and symbols which shape human behaviour and are transmitted from one generation to the next. In figure 9 is presented some elements of the culture.

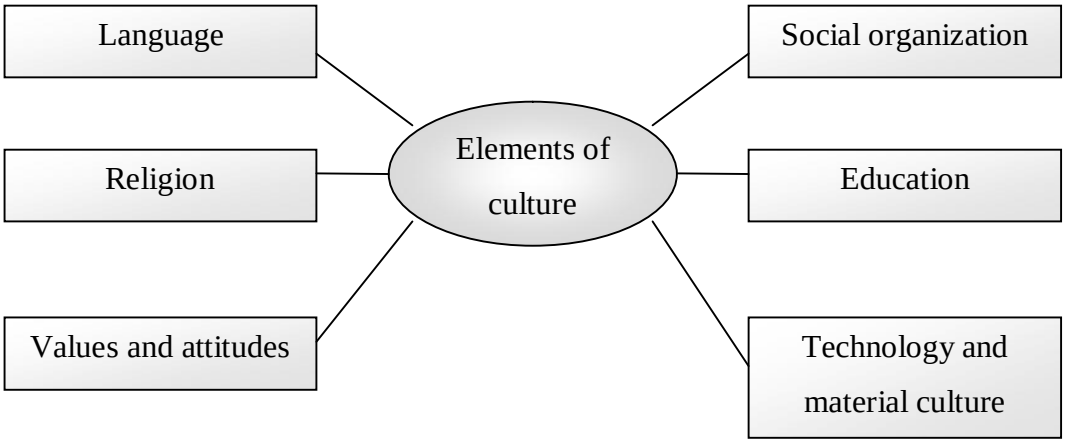

Figure 9. Elements of the culture (Adapted from Bradley, 2002, p. 88)

As noted, culture consists of multitude of elements. Language defines common concepts between people, as values and beliefs, which may have different meaning in other languages. Religion has conventionally a long history in creating peoples' culture.

Values and attitudes can be based on long tradition or they may arise from current issues, like political activity. Social system differs in various countries, which reflect peoples beliefs as well. If the social organization can not be trusted this may result as instability in the whole region or the country. The level of education, including literacy rate, diverges among the regions and countries, thus people may not even be able to understand writing or the content of it in some cases. Moreover, technological and material differences can exist. All together these discussed elements can be seen as critical factors of the culture.

With some common ground in experience and culture, customer and supplier share similar expectations of a situation, the decisions to be made and the implications of those decisions. They also recognize the style and pattern of communication to be used. (Bradley, 2002, p. 372) In some countries people may have prejudices towards foreign people and products, such as fear of contamination or change from outside. However, not all the attitudes are negative. People may have positive images of some foreign products and producers as well. (Bradley, 2002)

This section distinguished how culture may be related to business environment and that way also to innovation environment. Thus, evidently in an international innovation system cultural influences may be in a critical role. Next is examined an individual group of actors of innovation system that is considered as another dimension of scope of this study: small and medium-sized enterprises.

4.4 Innovation in Small and Medium-Sized Enterprises (SMEs)

As discussed, the industy is a critical sphere of the innovation system. Industry consists of all sizes of enterprises. Traditionally, the larger companies have had more resources, more influence and more visibility. However, small and medium-sized enterprises (SMEs) are a crucial category that should gain attention and support as well.

The most recent European Union’s definition for SMEs takes in account additionally Micro enterprises. Generally, the category of micro, small and medium-sized enterprises

consists of enterprises which employ fewer than 250 persons. In addition, an annual turnover of them should not be exceeding 50 million euro or an annual balance sheet total should not be exceeding 43 million euro (European Commission, 2006). Detailed classification, valid from January 2005, is introduced in table 4.

Table 4. Classification of SMEs by EU (European Commission, 2006)

Enterprise category	Headcount	Turnover	Or	Balance sheet total
medium-sized	< 250	≤ € 50 million		≤ € 43 million
Small	< 50	≤ € 10 million		≤ € 10 million
Micro	< 10	≤ € 2 million		≤ € 2 million

SMEs play a vital role in the European economy. In the expanded European Union of 25 countries, around 23 SMEs provide some 75 million jobs and represent 99% of all enterprises in the Union. Thus, they are a major source of entrepreneurial skills, employment and innovation especially. Though, they have restricted resources, like lack of financial and human capital (European Commission, 2006) and this usually reduces their access to new technologies as well it reduces their ability to introduce new innovations.

Simpler and more clannish structures of SMEs' may improve inter-organizational trust, communication, and cooperative competency that contribute to innovativeness (Olson et al., 1995; Sivades and Dwyer, 2000). By no manner of means all SMEs are rooted in a local innovative milieu but rather participate in different kinds of production and innovation systems at various levels, such as regional or national (Kotonen, 2007, p. 29). Beneficial progress in the activities of SMEs necessitates their constant ability to observe the changes in demand and operational environment. Therefore, the innovation policy should lead up to connecting the SMEs more closely to innovation networks in the heart of economy. (Kotonen, 2007, p. 30)

4.5 Mechanisms of the platform

Torkkeli et al. (2007) proposed that regions need to develop their regional public contribution with care. Regions aiming to develop their regional innovation system towards to include the practices of open innovation should take in notice a multitude of issues. Different factors come into play in a regionally operating innovation network system, which canonically constitutes a regional open innovation system. According to the Advanced Institute of Management Research (2004), the critical characteristics of an innovation system include at least the following:

- *Highly diverse*: network partners from a wide of disciplines and background who encourage exchanges about ideas across systems.
- *Third-party gatekeepers*: science partners such as universities but also consultants and trade associations, who provide access to expertise and act as neutral knowledge brokers across the network.
- *Financial leverage*: access to investors via business angels, venture capitalists firms and corporate venturing which spreads the risk of innovation and provides market intelligence.
- *Proactively managed*: participants regard the network as a valuable asset and actively manage it to reap the innovation benefits.

In addition, as discussed it is clear that SMEs benefit from strong networks. Torkkeli et al. (2007) further suggested that Regional Open Innovation Systems should strive to build close linkages not only between SMEs but also representatives of the other primary parties of Triple Helix III model, the universities and the government. Following the principles of Triple Helix III model, research institutes and government should actively look for ways to blur the lines between the parties, for example through the establishment of joint ventures with the private sector. Such a joint enterprise could take the form of an intermediary organisation which was discussed in chapter four. Moreover, the regional open innovation system should be designed to include both interregional and supraregional modes of functioning, including open exchange of innovation (Torkkeli et al., 2007). Additionally, Porter (2003) argued that clusters have a strong influence on the economic performance of the regions. However, clustering

includes a risk of excluding options outside the clusters and coordinates resources towards the clusters instead of free creativity.

Innovation communities often consist of tools and infrastructure that aim to increase the speed and effectiveness with which users can develop and test and diffuse their innovations (von Hippel, 2005, p. 93). The basis of the innovation system may also be created by different tools which help and support in the different phases of the innovation process. Therefore, from the innovator's perspective the whole system can be seen through innovation process that the innovation has go through, from an idea to the markets. If different stages of this process can be identified, innovation can be more effectively supported in the system.

4.5.1 Stages of the Supporting Process

According to Cooper's (1990) Stage-gate model innovation eventually reaches the stage where it is ready to step to the markets. However, before this stage may have been done feasibility studies on such fields as needs of the customers, economic and technical environment, and legal and marketing environment. However, the preparation for entering the markets differs a lot among innovators. Different sizes of companies have various resources, networks and channels. Usually small and medium sized companies do not have enough resources and for instance academic innovators and other new entrepreneurs may have even huger lack of resources. Hence, the regional innovation system is needed to support and promote innovations that otherwise would not be so effectively commercialized.

4.5.2 Collection methods of the innovation

The chapter two examined us how innovation originates from different sources and especially from the networks between those sources. To promote innovations those must

be found and collected effectively. Thus, the opening the helices of Triple helix is vital. By a closer cooperation knowledge and innovations can be more effectively transferred. In addition to deeper collaboration between universities, firms and government, other significant mechanism is innovation brokers. They can seek new innovations through their networks and even persuade innovations with their systems. (Chesbrough, 2006a)

4.5.3 Protecting Innovation

After the innovation is tested and prototyped etc. it may be well-tried to enter the markets. However, before the innovation can be taken to market it usually has to be protected somehow. As prior chapter examined there are many various ways to protect the intellectual property and all the IP can not even be protected. However, the solving the intellectual property rights can be seen as crucial step of innovation process. Especially this kind of services can be seen to be important to be available for small and medium-sized enterprises. Hence, IPR-services are placed in the early stage of the promotion process, and those should be a natural part of the innovation supporting system.

4.5.4 Commercialization of Innovation

Commercialization is the step where the value of innovation is capitalized. What ever the type of innovation is, the fundamental intention is to gain some added value. As it can be sure that needed protecting strategies has been taken notice it is time for a real market entry. To make the commercialization process more efficient different promotion methods are used.

Promotion of innovation can be seen as a very broad concept. Promotion includes all the ways available to make a product and/or service known to and purchased by customers and clients. The word promotion is also used specifically to refer to a particular activity

that is intended to promote the business, product or service. Thus, generally it means different ways to promote an innovation. Promotion is a part of marketing mix which is also known as “four Ps”. Other pieces are product, price and place. Promotion may include sales promotion, advertising, sales force, public relations, Internet etc. to reach the trade channels and the target customers. (Kotler, 2000)

When discussed about commercialization of innovation two different perspectives can be viewed: company’s perspective and innovation system’s perspective. Company has its own standpoint when it attempts to take an innovation to the markets. However, also the innovation system could and should help innovations entering the markets. As one mechanism at the system level can be seen the regional actors such as expertise centres.

In general, selling and buying of innovation is a complex process, from any perspective examined. The business to business standpoint includes the extra challenge that the customer usually tries to use the acquired innovation add more value in his own process. Chaudhuri (2007) stated that buying an innovation requires a contingent approach, not one standard model, which many firms have tried to implement. Further, marketing focuses on the needs of the customer. Therefore, it should begin with an analysis of customer requirements, and attempts to create value by providing products and services that satisfy those requirements. However, a new innovation may not always have clarified markets neither customers. This is another step when the lack of resources may exist, especially as considering other than local markets extensive knowledge is needed. As previously stated some innovations may exist but those may see light as market innovations as they are introduced in the new markets.

Conversely, Tidd et al. (2005) discussed that many of the standard marketing tools and techniques are of limited utility for the development and commercialization of novel or complex new products or services. A number of weaknesses can be identified.

- *Identifying and evaluating novel product characteristics*. Marketing tools such as conjoint analysis have been developed for variations of existing products or products exentions, and therefore are of little use for identifying and developing novel products or applications.

- *Identifying and evaluating new markets or businesses.* Marketing techniques such as segmentation are most applicable to relatively mature, well-understood products and markets, and are of limited use in emerging, ill-defined markets.
- *Promoting the purchase and use of novel products and services.* The traditional distinction between consumer and business marketing is based on the characteristics of the customers or users, but the characteristics of the innovation and the relationship between developers and users is more important in the case of novel and complex products and services.

In addition, they emphasized that before applying the standard marketing techniques, a clear idea of the maturity of the technologies and markets is needed (Tidd et al., 2005, pp. 240-241)

4.5.5 Communication

Further, communication is an essential part of innovation promotion, since promotion is mostly about communicating between buyer and seller. Every company is unavoidably cast into role of communicator and promoter. The communications mix, which is also called promotion mix, consists of five major modes of communication (Kotler, 2000, pp. 587-588):

- *Advertising*: Any paid form of nonpersonal presentation and promotion of ideas, goods, or services by an identified sponsor.
- *Sales Promotion*: A variety of short-term incentives to encourage trial or purchase of a product or service.
- *Public relations and publicity*: A variety of programs designed to promote or protect a company's image or its individual products.
- *Personal selling*: Face-to-face interaction with one or more prospective purchasers for the purpose of making presentations, answering questions, and producing orders.

- *Direct marketing*: Use of mail, telephone, fax, e-mail, or Internet to communicate directly with or solicit a direct response from specific customers and prospects.

These five modes include numerous communication platforms, and the recent technological development has increased the possibilities. Sales promotion tools are useful as they include a distinct invitation to engage in the transaction. Additionally, they gain attention and usually provide information that may lead the customer to the product. Personal selling is the most effective tool in building up buyer preference, conviction, and action. It involves an immediate and interactive relationship between two or more persons. The appeal of public relations and publicity is partly based on high credibility. Public agents are more authentic and credible to customers than advertisements. (Kotler, 2000)

Promotion and communication can be seen as significant elements of the process where innovation is taken further to the markets. These can be used as traditional way to promote innovations to go further in the markets. However, especially from the system aspect promotion can be used to support different, also non-obvious, sources to come together. Of course, not all the tools can be applied at system level.

This chapter discussed the regional open innovation system and the different elements of it. In the chapter were also examined further dimensions of the system such international which brings in a cultural influence and on the other hand the role of the SMEs in the system. At the end, a theoretical mechanism for the system was examined from the innovator’s viewpoint.

5 FRAMEWORK FOR CROSS-BORDER INNOVATION SUPPORT PLATFORM

Based on the theoretical review taken prior, researchers are setting high expectations on more open innovation processes and systems. A global market for intellectual capital is emerging, supported by modern communication technology and the urge to incessantly develop new, innovative products, services and processes. Converging knowledge flows have been recognized to generate new ways of creating value. Consequently, companies are increasingly realizing the benefits of using external sources of innovation in order to be able to capitalize on the global pool of competences. Simultaneously, the potential value of previously unused or underused knowledge, such as research results or technologies, has been recognized. (Törrö, 2007)

In light of previously published scientific articles, it seems that intellectual capital brokering services are a promising new business model, but little is known about the fears and expectations of companies regarding the use of these services. In addition, the regional level of innovation system has gained increasingly more attention especially because of small and medium sized enterprises. Even though, SMEs may act internationally or other in wider scale than regionally, they usually start from some point building their operations. In many cases SMEs suffer from the lack of resources, such as finance and networks. Moreover, as the innovation system consists of the parts of two different nations the brokers can additionally provide intermediary services for cultural problem spots.

Figure 10 pulls together the current understanding of regional open innovation platform. This can be seen consisting of different elements, such as regional innovation systems and IPR brokering.

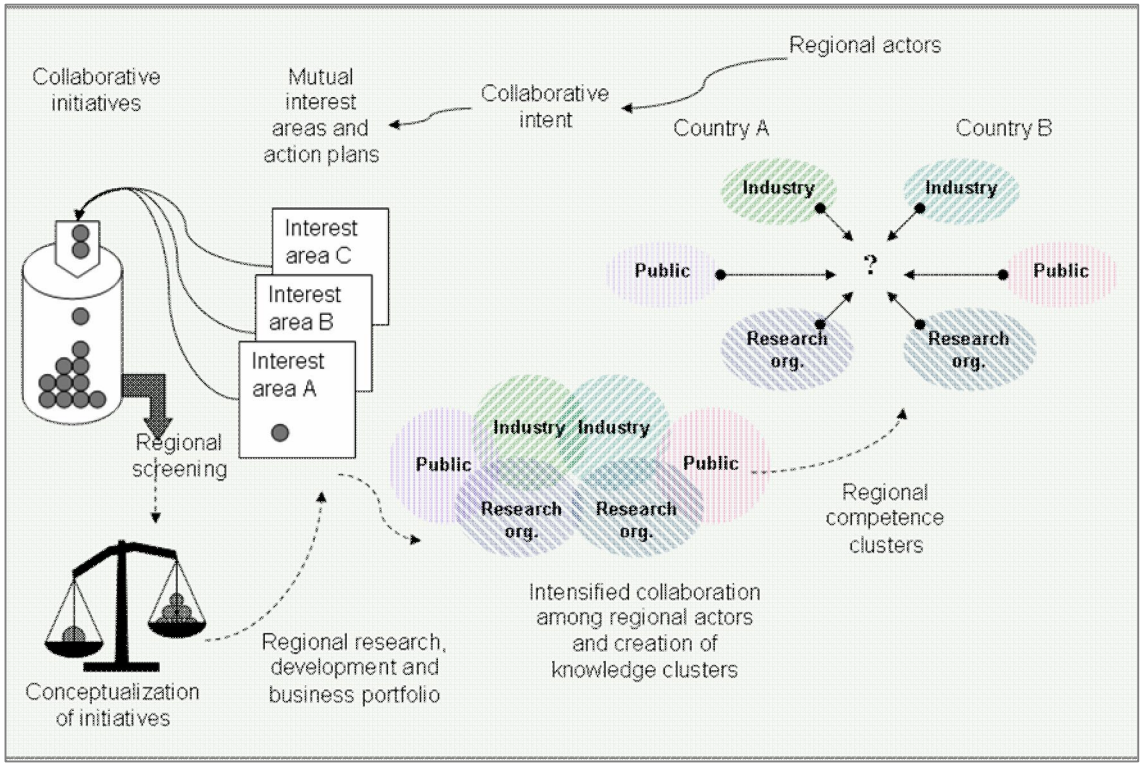

Figure 10. Cross-Border Open Innovation Platform (Adapted from Koivuniemi, 2007)

At the cross-border platform actors of two nations are supposed to operate in one system. The same collaborative intent is needed than in regional open innovation system, however in this case double number of actors is included. Thus, tight relationships between the actors are needed and through common interests new plans for action can be implemented. Regional screening brings out new ideas and innovations that can be taken through the process where initiatives are conceptualized and taken to different interest areas. Hereby, more commercialized novelties arise and the common interest areas may even form knowledge clusters by deeper involving. In general, the process occurs as a loop on the platform.

This theoretical model provides a good representation of the phenomenon, but leaves many questions unanswered. Especially how the actors can operate more tightly and is there an extra party needed to foster the process such as innovation broker. Also, as leveraging the brokering into framework of regional innovation system there are still the same challenges that Chesbrough (2006a) presented, such as managing and protecting

identity. As well the cultural context adds both opportunities and challenges that influence the system. The empirical part of this study tries to find answers how to establish the regional open innovation system, and which mechanisms and services are crucial for the system and how the process will actually occur for the small and medium-sized enterprises.

6 ST. PETERSBURG CORRIDOR PROGRAMME

St. Petersburg Corridor is a cooperation programme for South-East Finland, St. Petersburg, and the Leningrad Region (Leningrad Oblast). During 1990s several individual co-operation projects between the cities of South-East Finland, St Petersburg, and Leningrad region were carried out. However, the results of these projects did not always return the desired results. A need for bigger completeness was realized to achieve more considerable outcome by having better coordination. Thus, the first ideas of integrating the resources of the area under the concept of St. Petersburg Corridor were presented in December 2002. The main objective of the programme was to combine individual business and research projects into strategic cooperation within the entire area of South-East Finland, city of St. Petersburg, and the Leningrad Region. (Bergman, 2007)

The agreement on cooperation was established on June 2005. The Chairman of the Committee of External Relations of the City of St Petersburg, the Chairman of the Committee of External Relations of the Leningrad region and the representatives of the Cities Lappeenranta, Kotka, Kouvola and Mikkeli signed a record where the parties accepted the Vision 2013 document and agreed on continuing cooperation on the basis of the document. Right afterwards, Imatra and Savonlinna were invited to join the programme. Vision 2013 defines some goals for the programme:

- St Petersburg Corridor will be known globally as an area of cooperation between Russia and other parts of Europe.
- The Corridor area will become an economically, functionally and socially coherent entity.
- The area will evolve into an internationally attractive location for businesses and a significant driving force for economies in the area of the Baltic Sea.

The ultimate goal is that the Corridor would be evolved into the true Heart of the Northern Dimension within the EU. The official agreement on cooperation was signed on March 22, 2007. (Psarev, 2007)

6.1 Introduction of St. Petersburg Corridor Region

Saint Petersburg is the second largest city of Russia with the population of around 4.7 million and it's located at the Baltic Sea. Surround the city of St. Petersburg is Leningrad Region with its 1.7 million inhabitants. In the city itself operates around 130 000 enterprises and in the Leningrad Region are somewhat 10 000 enterprises in action. Other big cities are Vyborg and Svetogorsk (Psarev, 2007)

In South-East Finland almost half a million people live, and the biggest cities are Imatra, Mikkeli, Lappeenranta, Kotka, Kouvola and Savonlinna. Over 21 000 enterprises act in the area. (Psarev, 2007) The whole area of St. Petersburg Corridor is presented in figure 11.

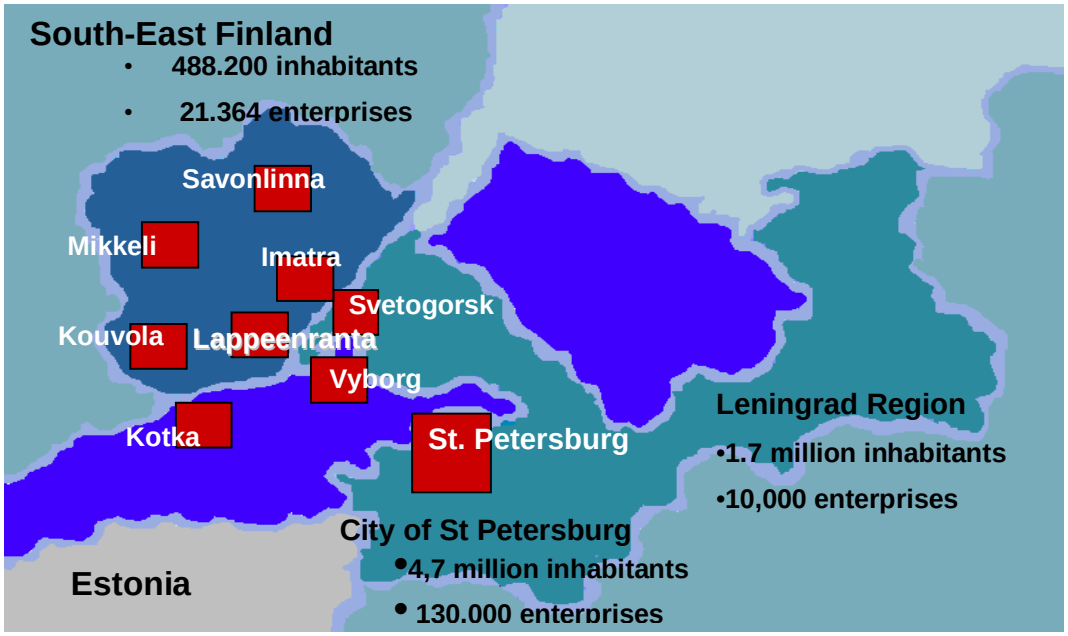

Figure 11. St. Petersburg Corridor area (Psarev, 2007)

St. Petersburg has an enormous intellectual potential. In the city are located 252 scientific institutes and organizations and over 100 universities (Bykov, 2007). On the South-East Finland side are located only one university (Lappeenranta University of Technology) and some branches of other universities. In the South-East Finland is the world known concentration of forest industry and besides that the companies of the area

conduct business in other sectors such as logistics, material technology, and environmental technology. The city of St. Petersburg has competence on several sectors, such as information technology, shipbuilding, energy engineering and nanotechnology (Bykov, 2007).

6.2 Action mechanism of St. Petersburg Corridor

The Corridor itself acts as an umbrella programme to coordinate the smaller blocs. The programme consists of five different working groups which and the operational work is done within these groups. The groups are following:

- *Working Group 1: Business collaboration and cooperation development.* The aim is to create dynamic commercial activity between the companies, supported by joint business services and advantages of geographical proximity.
- *Working Group 2: Increase of innovation know-how and support of innovation diffusion* through creating Regional Open Innovation Platform.
- *Working Group 3: Welfare and tourist industry development.* The aim is to create regional tourism and wellness platform content development in practise.
- *Working Group 4: Logistic and transportation network development.* The aim is to create regional joint competitive edge as a transport route and logistical nexus.
- *Working Group 5: Environmental protection and development of environmental technologies.* The aim is to create co-operation in regional environmental protection and development of environmental technologies.

The working group two, which intends to create Regional Open Innovation Platform, is subdivided into working packages. The current packages are innovation partnership, Finnish-Russian innovation center in St. Petersburg, Finnish-Russian innovation center in South-East Finland, Innovation support network in Leningrad Region, Innovation promotion system and Finnish-Russian Innovation University.

Further, the innovation promotion system concentraits on five working packages. The first is to develop the structures and methods for innovation promotion system. Second

is to develop electronic support system for the networked innovation actors. The third is to study on the state of the art on IPR issues both in Russia and EU, which includes IPR service portfolio for companies and non-profit actors on the both sides. The fourth package includes establishment of international network for the collection and promotion of innovations. The fifth consists of creation of ongoing innovation exhibition for the companies and the universities.

7 INTERPRETATION OF RESULTS

Prominently, on the both sides of the Region is found innovation capabilities that could be used more efficiently to the both directions across the border. Both have their strengths and weaknesses, as well opportunities and threats regarding to their innovation capabilities to keep the area's competitiveness at a high level. Especially in Finland the closeness to Russia was realized as an opportunity. According to one Finnish industry representative in the survey, "*closeness to St. Petersburg is an enormous possibility*".

Generally, the opinions of the respondents regarding overall innovation environment obeyed the current public view: several actors, at each levels; municipal, regional, national, have established studies on upgrading innovative performance. Recently all the possible institutes and individuals have emphasized the importance of innovative competitiveness in the every media that occasionally the concept of innovation is even threatened to suffer inflation. However, this may only be a sign that more concrete projects should be conducted instead of continuous flow of expert reports. Also in South-East Finland the bottlenecks seemed to be taking of the mechanisms and projects to the grass roots that the individual entrepreneurs would catch the real plan. As one specialist situated there is a need for real actors to take care of concrete projects. (In this context a specialist means a survey respondent that has a strong experience on his working field.) At the same time, in Russia the mechanisms didn't appear to be clear and capable enough to create effective public platforms.

The following sections will examine further the prior established model in the theory part and how and in what form it can be applied to St. Petersburg Corridor Region. First is introduced more specifically the prevailing innovation landscape in the Region according to the picture that the interviewees have given. The different actors of the innovation network are introduced and their roles are discussed. The innovation database is examined and its role as a tool in promoting innovations. Finally, some other mechanisms such as innovation exhibition are studied. The chapter should leave a canonical understanding of the region as an innovation system and of the climate towards further implications.

7.1 Innovation landscape

Among few interviewed specialists Russians are remained as relatively technology oriented in their innovativeness. The research has been heavily influenced by the government. In consequence, the companies have not been that able to innovate to the needs of the markets. The innovations in North-West Russia are holding some gap between science and business. When opening up the innovation system to cross-national extent these same problems are supposed to stay. This may cause some miss expectations and misunderstandings when Russian innovators expect their outputs to enter the European markets even though those still are insufficient to any markets.

The Finnish companies have had the same kind of problems of having technology and engineering oriented solutions. Traditionally, the USA has been known for its market oriented innovations and how they are good at applying the knowledge and technologies. Although Finland is not the leader at market innovations their gap between research and markets is not that wide that it is in Russia. This may, however, strongly relate to different political backgrounds: communism vs. capitalism and its influence on market behaviour.

One remarkable issue is clusters in South-East Finland and especially the Forestry cluster. The South-East Finland is the leader regions in the paper industry, it has the top know-how in the world, but on the other hand this region is also quite dependent on that industry. Not only some of the region's largest companies and the employers come from this industry but also the supply chain commits several small and medium sized companies. Many of these suppliers may be very capability but they have done the same business for years according to the orders of large paper companies. Consequently, many SMEs in the South-East Finland do not have their own products to offer other markets and thereby they have lost their product innovativeness.

The Finnish companies on the other hand may in some cases have all the needed resources available but they are not able to realize the advantages of entering the Russian markets, or in other words they are not willing to take the risk. This means that

the system could be able to support the companies but the companies don't want to grow. Therefore, it is more about the issue of communication and prevailing business climate which allows companies to operate without willing to go abroad more intensive. In Russia instead, the most significant barrier seemed to be legislative factors, mostly IPR-politics. The IPR-issues will be more discussed in later sections as they are in a key role in the innovation system.

7.2 Innovation network

First theme was to identify different actors and their roles in the Corridor region. This helps to recognize the existing structures and further improvement needs of those structures. The survey indicated that organisations are needed to systematize the structures and to make the services of the network available neutrally to everyone. Even though, some emphasized the importance of individuals in the network, the overall picture was to build support system based on the organisations. In Finland existed several networks and structures to support innovations and there was no significant need for a whole new organisation rather integrating and better utilizing of current ones were perceived to be more important. One specialist argued that it is only waste of time to start building new systems instead already existing systems should be paid more attention and those should be upgraded if needed.

However, in Russia there were no clear structures identified except some individual segment oriented state organisations. It may apply cultural and historical causes, such as former political structures, that in Russia the current innovation support system is not so organised that it is in Finland. Though, in Russia exist own research institution for almost any industry, however, this solution does not comprehensive support the overall innovative performance.

Anyway, a clear gap was emerging among the innovation activities between the Corridor actors. This gap did not only exist between Finland and Russia it also appeared between Leningrad Region and St. Petersburg. Besides in Finland was occurring typical

information breaks between the regional actors. This reflects the need for a common tool between the actors. Thus, the need for commonly recognized structures is very relevant.

7.2.1 Various actors in the Region

Some clusters were seen as crucial in the Region, especially the forestry in the South Karelia and Kymenlaakso. On the other hand, clustering had affected in South-East Finland that regional expertise centres focused on operating actively in the field of their cluster and had more or less excluded other industries to less effort. This naturally has directed the resources among few industries which also has partly been the object of national policy to be the best in few areas. In addition, the national expertise centre programme was reproduced for season 2007-2013 to become cluster based (Oske, 2007). However, not all the innovations can reach the best success in the markets that were the first intended plan of an innovator. The innovation should be able to find alternative channels and applications, and the intermediaries such as regional expertise centres should be able to help in this process. The national expertise centre programme is regionally driven by regional development companies (Figure 12).

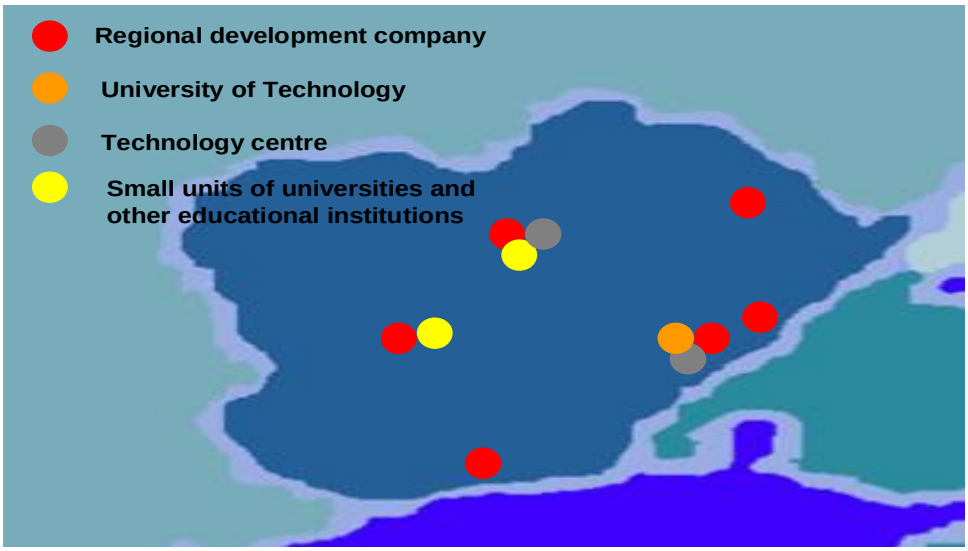

Figure 12. The objects of innovation infrastructure in South-East Finland

Regions in South-East Finland have some divergences in their regional actors and especially in the educational presence because only one university is located in the whole region, in Lappeenranta. However, universities of applied sciences and smaller units of universities exist in other cities. Further in Lappeenranta and Mikkeli are located technology centres to promote innovation premises.

In St. Petersburg a crucial role was given to existing structures such as numerous universities and other research institutions as well innovation-technological centres (ITCs) were seen in a significant role. In an important role were seen also some governmental activities like Committee on Information Technology and Communications. In addition, a range of research areas, technology parks and investment centres are established in the St. Petersburg (Bykov, 2007) The figure 12 illustrates the objects of innovation infrastructure in St. Petersburg.

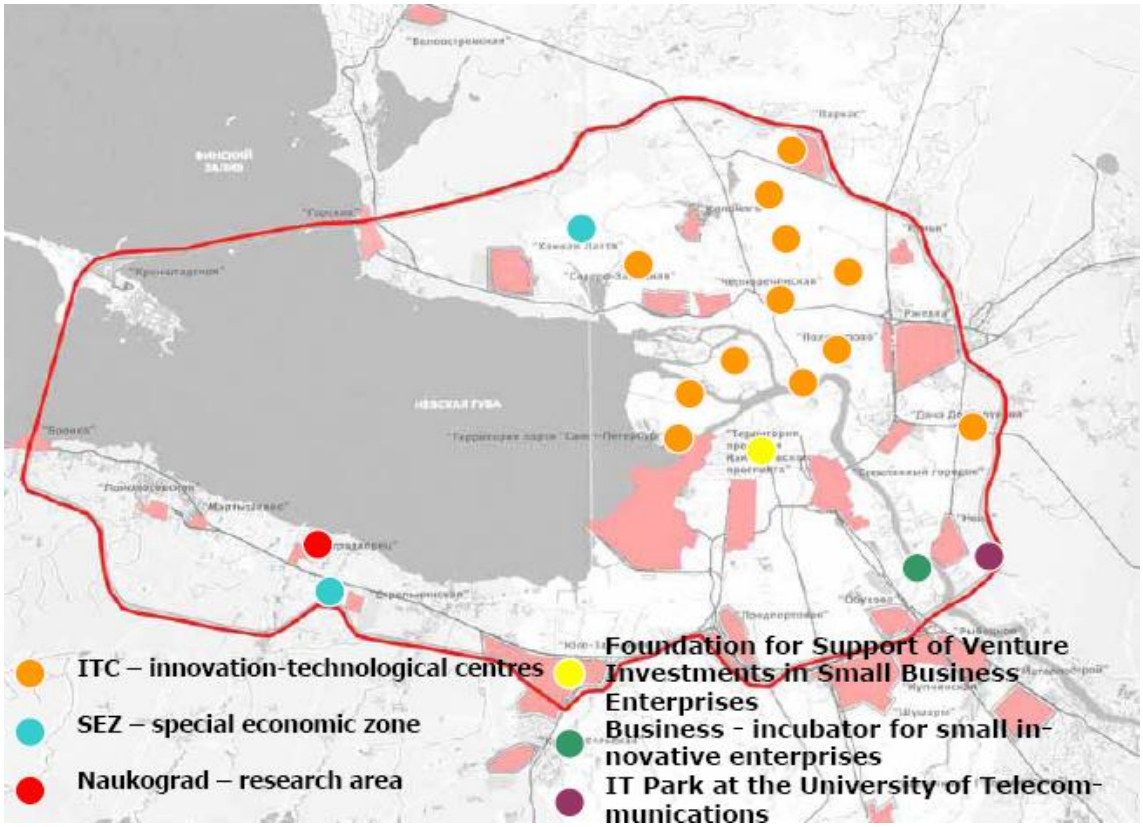

Figure 13. The objects of innovation infrastructure in St. Petersburg (adapted from Bykov, 2007)

In the Leningrad Region the structures didn't emerge that clear. One reason is a lower research activity in the region. Additionally, concept of innovation centre is rather unknown in this region and the local enterprises could find it difficult to realize any benefits for such a centre. However, one connecting actor could be an industrial park found in Viborg, close to common border of Finland and Russia. Other notably existing structure is the cross border city programme that aims to enhance common practices in the number of border cities. Generally, in the Leningrad Region should be taken smaller steps with localised entrepreneur-friendly approach.

All the interviewees emphasized the importance of funding services and activities, both public and private ones. In Finland the financial markets are relative small and venture capital markets are young (Komulainen, 2007). As well in Russia the financial markets don't communicate enough with the SMEs. Thus, one significant factor is to integrate both public funding mechanisms and private investors into the cross-border innovation network.

The most crucial element of the network is seen in the companies. Besides governmental institutions, research institutions, investors etc. the existing companies must be recognized. Many respondents emphasized firms' role and that the network should communicate more effectively with them.

7.2.2 Innovation Brokering

Public actors as innovation brokers' role were not seen plainly trusted. The higher lack of trust towards public institutions was seen among Russians. The Finns were only worried about the unprotected ideas and projects that information of those wouldn't drain to competitor's hands. South-East Finland is fairly small region by population and acting in the regions is relative transparent. In regions such as Kymenlaakso the public activities can personify among individuals because of the small organisations. These individual actors can raise prejudices towards whole organisations.

Conversely, in Russia was able to be examined a need for common broker. Though, one big barrier was the mentioned IPR-issues in order to prevent exploiting of ideas. As well the same trust question on individuals exist in Russia and it creates even more serious threat there than in Finland.

Few Finnish respondents questioned the demand for brokering as the volumes would be so small, especially among SMEs that there wouldn't be justification to offer such a service. But this prejudice was mainly based on the lack of resources and therefore no organisation was willing to take the intermediary's role in the region. Overall picture, however, was that the region needs some kind of active actor that can operate at several different surfaces that were distinguished in the previous section. One of the most crucial elements was seen a transparent process for brokers' activities and availability. A suggested approach to integrate the other surfaces like universities was a commonly shared tool. This tool will more in detail examined in the further sections.

7.2.3 Services for SMEs

In theory the innovation system was approached from the innovation process viewpoint where enterprises and innovators need various services during the process. This was distinguished several times by the interviewees: that a clear process pipe of services should be offered for the companies in the region. Some respondents though claimed that this kind of services already exist and are offered for the companies. This conversation was mainly hold among Finnish actors. Thus, the need for this kind of services exists and especially the need for informing about these services. Also, the Russians supported the concept of one-stop shop for the information promotion. In other words, the services can be provided by several actors but the information about these services should be found from one place. This fact was realized by both Finnish and Russians. In addition, providing this information supports the wider availability of the services for the companies.

The current state is that the services are provided but not in every city and the information about these services is not shared systematically. On the other hand, in Finland are other projects working with these information and communication issues of the enterprise services at the national level. One national project is YritysSuomi (EnterpriseFinland) that aims to collect information about all the public services under one portal. These projects should be taken notice while implementing the cross-border service because especially in Finland there is no place for several competing public platforms. A wide range of competing platforms offering services for the companies may end up confusing the entrepreneur and eventually no one can be sure which service provides the needed information. Most probably this ends up entrepreneurs to loose their interest in the platforms as they don't have enough time for going through all the existing platforms.

The concrete needs that the respondents brought out were not harmonious except equally shared opinion of the IPR-issues and financing solutions. Other needs were mostly random guessing of what might be relevant to SMEs when they are developing their operations. This of course reflects that every need is case specific and the most important then is to offer the information how to fulfil every need. The figure 13 distinguishes the elements of the needed process.

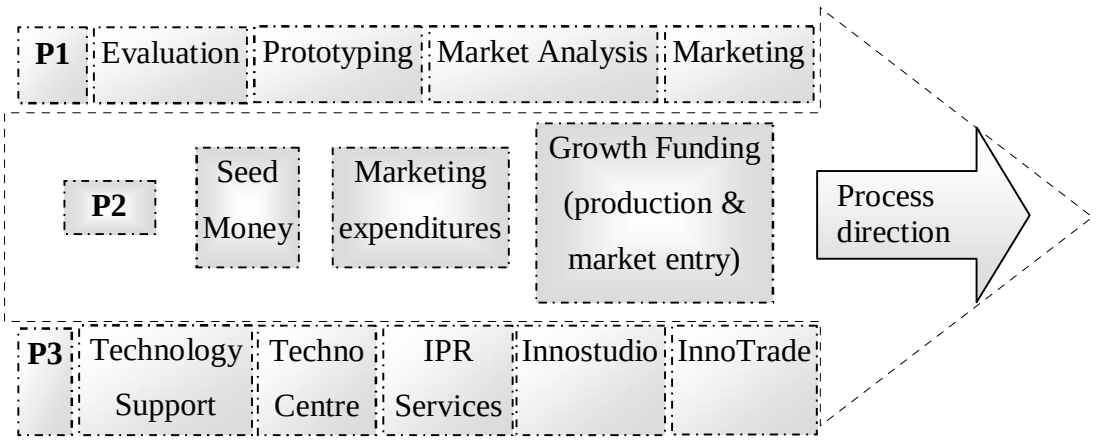

Figure 14. Process of services for internationalizing SMEs

The process is divided into three parts: innovation process oriented services (P1), financial services (P2) and continuous support (P3). The innovation process oriented services include various kinds of support that is needed until a single idea reaches markets. These services can be for example early evaluation of the idea and in further stage prototyping of products. Finished products and services etc. need usually market analysis before entering the markets, and as those eventually enter the markets various marketing mechanisms are needed to ensure the commercial success. As prior distinguished these types of services already exist and more important would be better informing of the providers. Therefore the survey respondents were not able to identify any specific needs in the region that would not been offered. Though, several these kinds of services can be assumed to necessary parts of the general supporting system. However, one interesting already concrete procedure was using evaluation board. This was established in Lappeenranta area and it didn't exist in any other areas. The evaluation board is formed of specialists that can be for example university people or people from different industries. It is mostly established in the context of the university but a wider and more public use could be considered, such evaluation of companies' ideas. In addition, the survey answers showed that the type of service could be a very functional solution in other areas in the Corridor region.

Other dimension is connecting the financial services all the way along the process. Individual ideas and small companies often have a need to find seed money for an initial start. The role of the funding is to enable the company to go successfully through the innovation process. In addition, funding is needed when the company starts to grow in which case capital is needed for example for investments and various projects. Crucial is to have a comprehensive competence of financial options connected to these other services, in other words the know-how of the funding options should be found from the same place than the information about services supporting the innovation process. Financial services are separated from the other services as their nature differs as well. Other services usually need capital but financial services are to offer it. The survey resulted as well that the financial mechanisms are not yet efficient enough, not in South-East Finland nor in the North-West Russia. The need for further development of the financial presence was heavily weighted by many regional actors and entrepreneurs.

The third and the most concrete dimension was establishing some services for a continuous support. This type solutions brought out were: providing technology support, techno centre, IPR-services, Innostudio and Innotrade. These support services could be provided in a one place, in a same place where the information regarding other services is established. Some of these suggested services may be case-specific for the needs of this region. However, a few very open innovation -related approaches can be seen as more general elements of the innovation system, such as a crucial role of the IPR issues and need for innovation trading.

The technology support is to answer various technological questions that SMEs may have. The companies have place to receive help for their technological problems and the service provider has resources and connections to offer the help. A need for this was especially realized by the Russians. Rapid technological change makes it hard to keep track of everything. Thus, some special service for that was seen useful as well. Besides, disparity between Finland's and Russia's development appear in technological differences as well.

IPR-questions create another really concrete need that should be settled. Allocating intellectual property rights has been one of the most discussed problems in Russian science and technology policy (Desai and Goldberg, 2007). OECD (2005) listed in its main recommendations Russia to remove rapidly uncertainties regarding IPR. The problem is recognized on national and local levels as well. Bykov (2007) underlined the legislative gap that there is no federal innovation law which causes problems with protecting intellectual property. Also, the survey results highlighted the prevailing problems in the IPR issues. In Finland the interviewees did not regocnize any problems on this matter. Thus, a crucial step is to establish Finnish, European, practices on IPR. Promoting rooting of various IPR consulting and law services in St. Petersburg can be seen as a one small step enhancing the innovation environment.

InnoStudio is a modern meeting and group work facility that utilises information technology. This concept is based on a group decision support system that aims to enable all the ideas to be utilised more efficiently without any social blocking. (Innostudio, 2007) It has been run in Lappeenranta and Kouvola. This has carried out

good experiences on promoting innovations. The respondents recognized that the concept could be implemented also in cross-border supporting which means providing this physically in St. Petersburg, at least.

InnoTrade concept has been partly introduced already. Concretely this could be established in a form of innovation intermediaries and brokers. It also includes these actors to be located physically and the most obvious place would be at the same facilities with the other services. Next will be discussed further an electronic tool for brokers which also allows their services to be virtually available.

7.3 Electronic database

In this section is first interpreted the results of the survey to gain a comprehensive picture how the database could be implemented in the region. In other words, the theory part examined various dimensions of innovation brokering and further how virtual environment upgrades its performance. However, all that may not be able to be implemented in any environment, thus, a case-specific study is desirable to secure a successful implementation. Further, is distinguished various already existing brokering systems, both public and commercial ones. Investigation of these actors creates an insight on what is done by now; in which dimensions and scale and what kind of technical solutions are behind these brokers. Finally, bases to define further specifications for a database in this context should be formed.

7.3.1 Innovation database for the St. Petersburg Corridor

In the survey were studied respondents opinions towards an electronic innovation database. Partly, the survey was supposed to strengthen the vision that electronic database could be a helpful tool for innovation promotion and on the other hand was distinguished in what scale the database could be established, in other words further

specifications of it. During the survey appeared that already in Finland exist about 30 databases which are somehow related to innovation exchange (Juuso, 2007). Mostly these are driven by public organisations and according to some interviewees: we have already enough databases and more vital is to increase the performance of existing ones than to create new ones. The Russian respondents were also able to come up with some advantages that database could offer. Table 5 below establishes the recognized advantages and challenges that the respondents were able to identify.

Table 5. Realized advantages and challenges for users of innovation database

User type:	**Advantages**	**Challenges**
All users:	available globally	structural limitations
	transparent	inefficiency (not updated)
	availability of information	IT-security challenges
	improving mutual trust	information waste
	electronic tool	continuous maintenance
	brokering of competencies	IPR challenges
	cross-scientic	confidentiality
	usability	public-private?
	faster knowledge spillover	
Innovator:	service search	information drain
	search for financial sources	lack of trust and time
	feasibility testing	
Customer/Financer:	sorting	fragmentated databases and data
		inadequate descriptions

Table displays these categorized in three aspects: innovators which is in a role of seller and customer which is the in the role of the buyer, additionally, the possible financer or investor may have the same perspective in this context. Thirdly is presented all the advantages and challenges that apply all the users. Especially the distinguished benefits support the features that Törrö (2007) classified. The challenges are also important to be conscious of. This way those can be seen as threats that has to be reacted as creating the system itself and then the likelihood for unpleasant surprises is lower.

Some of the challenges are typical for any database to be implemented. Such as structural limitations, maintenance and IT-security questions apply to all kind of databases. However, for example IPR issues, instead, are very case-specific to

innovation database. As prior stated in St. Petersburg Corridor case IPR issues are one of the most crucial generally. Other key question is the organisation behind the brokering whether it is a public or private one. Private was recognized to be more competitive and effective, beyond it wouldn't use public money. However, easy and relative inexpensive availability is necessary factor to truly enable service for SMEs. In Russian side was questioned which actor is more reliable. Some of the respondents emphasized that the broker should be public to be recognized and trusted by companies and research institutions. As well public-private model was suggested. Thus, it doesn't seem to be important by whom it is provided but rather more important is how it is provided.

Conversely, the Russians didn't mention any existing databases on their side. The idea did face some negative thoughts as well, such as: it is not realism. However, an obvious majority did see it as a good thing; a few even submitted the idea of some exchange system as they were still talking about network. This reflects how the time seems to be right for such an electronic system. In addition, the sceptic ones brought out their interest towards a system which proves to follow first-class processes and is recognized by case projects as a reference. Next are distinguished a few already existing innovation and technology trading systems which are supposed to offer a basic understanding of the prevailing landscape and the mechanisms that are already used.

7.3.2 Technology Market Place by Tekes

Technology market place is an exchange place for technologies operated by Tekes, Finnish funding agency for technology and innovation. The market place has been active since 1998 as it was realized that Innovation Relay Centre (IRC) didn't have any sufficient tool in their work of providing technologies and innovations. (Juuso, 2007) IRC Finland is a kind of network organisation, hosted by Tekes, helping companies with the transfer of international technology. IRC Finland is a member of a larger international network of Innovation Relay Centres, which consists of 71 centres in EU

Member States, Chile, Iceland, Israel, Norway, Switzerland and Turkey (Innovation Relay Centre, 2007). Noteworthy, the Russia is not, yet, a partner of the network.

Technology market place gets about 3000 technology requests per year and some 70 requests are made in Finland yearly. In Finland are six people in full-time job working among the technologies entered the market place. The market place itself acts as a tool and usually the real transfer needs strong efforts from the organisation. Though, some transfers have been made plainly through the help of the system without any involve by the support organisation. (Juuso, 2007)

The theory and the survey results endorsed as well that a background organisation is crucial. The brokering process occupies a group of people that need a deep understanding of the markets that various innovations or technologies can be transferred. In other words, the database is supported by active group of brokers. However, the database is not totally passive. By registration the user can receive emails about areas of his interested. In Finland this way, without human intermediaries, the technology is transferred only few times a year. (Juuso, 2007)

Notably, it is interesting how this kind of organisation can be dynamic, and how does it finance itself. Technology market place is funded half by European Union and half by the national funding agency. In the countries outside EU the state appears to be a full supporter. Another interesting is that the service is free of charge for the companies. So, it can truly be called as innovation promotion supported by government. (Juuso, 2007)

The market place is mainly focused on partner matching in different ways. Users are able to browse both technology offers and requests, in other words the brokering operates in both ways. Additionally, there is a third option where partners for different R&D programs can be searched. (Tekes, 2007) This doesn’t only mediate individual technologies but entire know-how of companies as well.

The technology market place has defined for its focus SMEs (Juuso, 2007). Offering this kind of service, for free of charge, for the SMEs is a progressive step to enhance those operating environment. However, the profile of the market place is relative

passive and it this way it is hard to be found for companies that don't have that much time to do extra research of the markets. Besides, the information hasn't either reached regional actors that well which act in closer contact with local companies and could communicate the information with them. In addition to lacking promotion of the market place, the operations model could include as well research institutions more clearly. Now there is only operating together a part of the industry and a part of the public actors. On the other hand this created more focus but undermines the efficiency of this system. Even though, the market place is offered by Tekes which is a public funding agency, linking in private investors could create a significant opportunity for faster growth of the users businesses, growth of SMEs. Table 6 pulls together the perceived advantages and disadvantages of technology market place.

Table 6. The advantages and disadvantages of the Technology market place

Advantages	Disadvantages
Availability (free of charge)	Limited focus
Wide international network and recognized background organisation	Public structures don't always support for improvements
Open for Upgrading	Limited Resources
Competence of technology politics	Limited Visibility
References of successful transfers	

The table illustrates that several improvements could be done for this system. However, these improvements are mostly technical, though lack of resources is a usual cause of lack of funding. Limited visibility mostly influences on communication level of the system and therefore the volume of the users stays low. By having a low profile the market place is hard to find and therefore not many innovations end up there. This can have an effect that customers and financers won't realize any benefits for taking part in the system. Generally, the wide international network of Innovation Relay Centres creates a significant base for technology promotion globally which can be seen as superior advantage over some technical and shortages.

7.3.3 Invention Market by Foundation for Finnish Inventions

The Invention market has operated online since 2003. Foundation for Finnish Inventions has published a list of inventions in news papers since 1970s but the online database is relative fresh. It is used to promote inventions of their customers, patent appliers, and the use is free of charge for them. The restricting thing is that it is only available for their customers. Thus, the volume of patents in the database is not so high. It has all the time around 80 active patents looking for further developer, financer, licensee or customers. (Sievänen, 2007)

The Invention market acts only in Finland and it devotes two persons full-time and few other ones are partially committed. The most challenging has been the maintenance of the system while to be trusted and acknowledged the data must be updated. In other words the completeness of the brokered information must be taken care of. The newest feature is publishing the Invention market in English. It was realized that larger potential of customers can be achieved that way and that the local, Finnish, markets were anyway too small for many inventions. (Sievänen, 2007) In addition, the name "invention" may sound too fancy for many innovators and they wouldn't end up contacting invention agents with their innovations. Table 6 pulls together the perceived advantages and disadvantages of Invention market.

Table 7. The advantages and disadvantages of the Invention market

Advantages	Disadvantages
Competent background organisation	Limited focus and network
Covering database of patents	Limited Resources
	Limited Visibility

Invention market acts clearly in a smaller scale than Technology market place. Juuso (2007) sees the Invention market and Technology market place as complementing systems instead of competing ones. Those both have their own interest areas and also little bit different operating models. Technology market place is free for every user and

it is internationally networked but invention market has more focus on promoting patents and its operating area is mainly in Finland. Additionally, the resources of Invention market are even more limited than Technology market place has. Therefore, the system is not able to reach very huge mass and eventual visibility stays low, including a relative low profile in the Internet as well. Hence, the overall volume of customers is low and also the financers may not find Invention market's services to be interesting.

7.3.4 Commercial brokers

The Technology market place and the Invention market are public projects. This, however, narrows the operation environment. It can not be avoided to mention in this context as well how important it is to be global at today. Especially in transferring technologies the needed competence and IPR may be located only few places in the world. Therefore, geographical limitations can create serious barriers for innovation brokering. Traditionally, geographical limitations are connected to public services as funding comes from the government and the government is not willing to fund other nations.

Thus, private actors are not presumed to face that kind of regional and political limitations as they have their own financing structure and business model. In addition, private side has a dynamic pressure to improve its operations in the fear of rivalry. On the other hand, private services are not always secured to be available for anyone in the same way that public services are. In addition, some private intermediaries can be expensive to use. However, their user base consists of both big and smaller companies. Especially small firms are seen as good solvers and they can provide new technologies to be that larger companies then acquire or license.

Generally these commercial brokers have adopted many important practises that the survey brought out as well: they provide the reference information, they report the high volumes in their database, and they attempt to describe the whole process they are

offering to their users. This way they have tried to make their service more transparent and reliable. This creates a clear distinction already to these two prior introduced public exchange places because those hadn't introduced their process that clearly.

However, to be a relative new field of business the commercial intermediaries have not yet been able to prove their profitability in a long run. Next are briefly discussed few commercial brokering companies to have an overall picture of different actors in the field:

Yet2.com

Yet2.com is an online marketplace for technology brokering, founded in 1999. It brokers existing technology and intellectual property. Yet2.com works with clients to write briefs describing of the technology that they are seeking or making available for license or purchase, and distributes these briefs throughout a global network. Network members interested in posted briefs make contact with Yet2.com and request an introduction to the relevant client. After opening, the parties negotiate directly with each other. Yet2.com offers companies the possibility to create revenue out of unused or under used technology by offering their intellectual property on sale in the online database. (Yet2.com, 2007; Törrö, 2007)

InnoCentive

InnoCentive is a web-based community that aims at connecting corporate clients with a network of thousands of scientists around the world. It is based in USA and it was established in 2001 from the initiative of the pharmaceutical giant Eli Lilly. After creation it has rapidly expanded to a wide variety of other industries as well. The incentive-based business model is rather simple: Corporate customers, called seekers, can post their R&D challenges in the InnoCentive online forum. On the other side are solvers to respond the challenges and advice the seekers. A network of solvers consists of scientists from more than 170 countries. Each challenge includes a detailed description of the problem, requirements, deadline, and the amount of reward. The name of the seeker company remains known only to InnoCentive, the intermediary. Scientists

around the world can register as solvers without any geographical limitations. Recently the most active solvers have been found in China, Russia and India. (InnoCentive, 2007; Chesbrough, 2006a; Törrö, 2007)

Innocentive demonstrates some important aspects of what innovation intermediaries must do to be effective. They must help shape the definition of the problems to be solved. Second, they must establish a process that protects confidential and proprietary information, including the identity of one or both sides of a transaction. Third, they must develop credible evidence to document its value to the parties in the transaction, both during the transaction and afterward. (InnoCentive, 2007; Chesbrough, 2006a; Törrö, 2007) All these aspects were highlighted in the survey as well.

NineSigma

The company was founded in 2000 with Procter & Gamble's assistance. Their model is based on a similar one to InnoCentive's - connecting companies with external sources for innovative ideas, technologies and services. NineSigma's solution providers include companies of all sizes, universities, government labs, private research organizations, and consultants. As a distinction from InnoCentive, in NineSigma's case the problems sent on the network of solvers are fairly broader, which requires more interaction between the solver and the customer. Therefore, a connection is established between after the two the most attractive proposal has first been selected by the customer. Another asset of NineSigma's approach is that the company is able to refine its extensive database of contacts from every search that it does. When contacts leave or change email addresses, the company is able to update its database accordingly. When responses come in, the company is able to analyse what factors increased the likelihood of receiving a response. (NineSigma, 2007; Chesbrough, 2006a; Törrö, 2007)

It can be distinguished that few of these brokers have already succeeded to gain some experience and user base. In the table 8 is illustrated some advantages and disadvantages of the brokers that can be perceived, from the perspective of this study.

Table 8. Some realized advantages and disadvantages of commercial brokers

Advantages	Disadvantages
No geographical limitations for operations	Limited availability and (case-spesific)
Transparent processes	Limited focus
References	Shared volumes between competitors
Wide networks	Profitability on the long run is still a mystery
Effective inducements (rewards)	
Refining of the database	

Generally, these commercial brokers have several mechanisms that could be also applied to Corridor region. Additionally, it is significant to recognize their world wide networks when considering building a new competing system. Thus, the Corridor's cross-border model should be distinguished with realized advantages compared to commercial ones, besides its geographical position. One advantage could be right focus that doesn't compete too much with the existing commercial brokers.

7.4 Innovation Exhibtion

In the survey was searched the climate towards physical cross-border exhibition of innovations. The idea to create a continuous exhibition did not reach positive answers. Respondents did not see it useful to organise particular physical facilities where innovations would be demonstrated.

The problems would be to find enough innovators and customers to make the show to bring in any added value. Without critical mass of innovations the investors wouldn't be interested of this system either. Persuading people to visit such an exhibition was seen hard as well. In limited facilities critical volume of innovations on display is another challenging task to carry out. Further, in a large city like St. Petersburg a continuous exhibition may not be very tempting because of logistical distances. In addition, it is difficult to make a positive difference to other promoting facilities which are more focused and this way serving better their customer base. However, an idea to build a yearly fair for innovations attained different, more optimistic, opinions.

7.5 Yearly Innovation Fair

A yearly fair could support an innovation database as bringing out the ideas and technologies more concretely. The database is a significantly good idea itself and various kinds of electronic exhibition can be added into that. But as prior mentioned the mutual trust is very crucial. Thus, the different actors could meet at least once a year and improve their level of collaboration. Additionally, the fair opens an opportunity to extend networks and to connect non-obvious partners for instance. As one specialist situated, *"the fair offers a contact forum for the innovators…and it is crucial to make it regular where all the important innovation actors of the region can meet"*. The main focus in the fair should be on innovators because they are the true input source. Nevertheless, the potential customers and investors are crucial elements of the successful show. A critical mass of all these three groups should be achieved. As well, public actors are important to take part as they usually create the premises for innovative actions, such innovation systems.

Using fair concept to promote innovations is a traditional marketing tool and this is why building new fairs can exist to be really challenging. The critical mass is crucial but how to prove to various stake holders the benefits for attending the fair. Some respondents emphasized the personal selling mechanism before the launch of the first innovation fair. Hereby, every potential participant would really separate this event out the other events. The personal selling is, however, relative expensive and needs resources even though it can lead to better results. In case of public intermediary would be the administrator of the database, promoting and brokering the innovations in the region, it should as well organise the fair event and provide a promotion process of the fair.

The needed distinction to other existing fairs can be seen in the whole concept. In more traditional fairs the purpose is to promote some industries, as for example electronics fair is a display for companies and products in that industry. The potential customers usually receive an invitation and they visit the event to get to known with the latest solutions. The innovation fair, however, would collect the mass of innovators and customers as well. Besides this, there are other elements, such partnering option for the

companies. The participating firms may already be looking for partners to develop further technologies or they might realize this kind of potential during the fair. Another crucial element, as already mentioned, are the investors which are there to look for investment targets. Some of these investors are not only after the return of an investment on a good technology but they are also to share their business know-how with SMEs that in many times lack in that field.

The million dollar question in execution of the innovation fair is whether to have some themes each year and how to build that. Various fairs that are built around different themes exist hundreds in the world and those definitely have gained some visitor base during the years. However, some of the interviewees suggested that the themes are needed to restrict the focus somehow. Though, clear definitions to some specific themes could be competing with existing fairs. Thus, several from 3 to 10 themes might be a solution where innovations do not pop up from every possible industry in the world but still there would be some variation in the supply. The variation is an important issue to allow more non-obvious sources to get together with each others. Of course, this non-obvious concept doesn't always lead to add any value but it is an essential factor to increase the creativity of the innovation system.

This chapter has interpreted the results of the survey. This chapter included also some further supporting data that was collected and examined to gain more comprehensive picture. Next is created further specifications for a cross-border innovation support platform based on the data display in this chapter.

8 CROSS-BORDER INNOVATION SUPPORT SYSTEM

So far, have been introduced the theory, a case environment and the survey results. This chapter aims to build up a model that is suitable for the case environment. The model is called Cross-border open innovation platform which should create a basis for a dynamic regional innovation system. This system is naturally supposed to develop continuously via learning by doing tool.

The previous chapter illustrated that Finnish innovation structures are further developed. Thus, this study aims to utilize some of these good perceived solutions at a cross-national level as well. In chapter five was created a theoretical framework for the cross-border open innovation model (see figure 10, page 41). The survey supports in many ways such a structure to be implemented in St. Petersburg Corridor Region. Various ways of cooperation between research organisations and industries were seen important and as smaller steps to further cooperation at even higher scale. It is also good to remember that innovation originates from different sources and linkages between them. Thus, all these small steps of cooperation are important to promote innovations cross-nationally. However, one of this study's main objects was to define a combining structures that could be linked to these sources and promote more systematically innovations in this network.

Based on the survey and the theory as well the combining structure can be a kind of innovation intermediary. The survey didn't plainly illustrate how important it is whether the intermediary is public or private. This question will be defined by the eventual operating model of it. Here is suggested to utilize existing structures that came out in the empirical study. The technology market place is a tool for European wide innovation network (Innovation Relay Centre). This network is based on public model and this way it is supposed to be available for all the SMEs. However, because of its limited operating area, only in some cities, it hasn't been able to reach all SMEs, in Finland for example. Their operating model is though open for further development and expanding to St. Petersburg has been under consideration (Kuitunen et al., 2007).

In previous chapter was argued a need to “build a bridge over the border”. Obvious elements are *Finnish-Russian innovation centres* established in St. Petersburg and in some place of South-East Finland. The centre established in St. Petersburg will accommodate Finnish institutes Tekes and Finpro (Finrpo is a consulting organization focused on accelerating the internationalization of Finnish companies). It must be paid attention to publish the same model in South-East Finland as well and some smaller office in Leningrad Region. As well, in the Finnish-Russian innovation centres could be located physically the services that were suggested in the previous chapter. Particular attention must be paid to establish proper financial and IPR -services. As one specialist argued there is a need for *“providing bullet proof options to keep the IPRs for their owners”*. At the same time these centres could be the base for a further expansion of IRC. The new intermediaries in the Corridor region may obey the existing operating model of IRC but further developing for the whole network can be done. In addition, the brokering model could be supported by yearly innovation fair. Further, as the theory and the examination of other intermediaries showed there are various alternatives to expand the current operating model of IRC. However, this survey didn’t establish the ultimate possibilities to apply IRC –structures in the Corridor. Thus, some critical reservation must be kept whether to adapt existing model or start building a new. Though, the survey environment emphasized climate against building new structures.

The network can cooperate through electronic database –tool. This technology marketplace has offered its services for SMEs but larger companies were seen crucial in this network as well. The larger companies can be seen as potential customers and partners. Also, the research surplus of larger companies and knowledge spill over of universities is potential element to include. Thus, the customer base should be extended somehow to cover wider scale of enterprises. In general, the tool itself needs further development. Some further improvements could be for example including various user roles such as provider, broker, customer and investor. Various searching mechanisms could also be added. In addition, in the previous chapter mentioned electronic exhibition features are a considerable option. Further in future, some kind of fee could be included. This fee would support continuity of the service and at the same time prevent unserious customers. However, at the beginning free of charge can be a right option to gain higher user volumes.

In the figure 15 are outlined the distinguished elements of the support system. The established services are offered by the Innovation Centres both in North-West Russia and South-East Finland, further the services should be provided in some form in the Leningrad Region as well. These actors need to be in a close cooperation with the other important actors of the innovation system which are industry players, research institutions and public institutions.

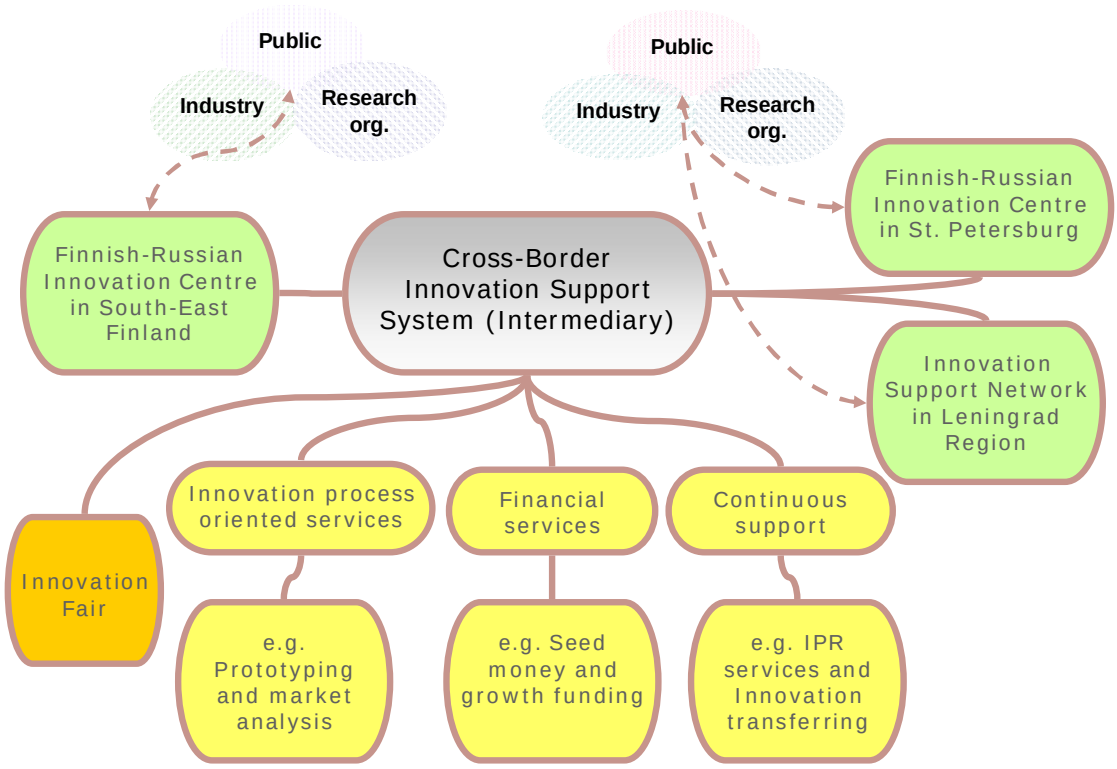

Figure 15. Cross-border innovation support system

To enable efficient collaboration between all these various players a shared common tool is in a crucial role in promoting the innovations. With this tool the information about area's intellectual property can be shared and provided, however, by using means of secure and transparent proceeding.

The survey tried to clarify any possible cultural challenges that could originate in the context of innovation support system. However, besides language the respondents were

not able to recognize any obvious cultural issues. Though, a possibility to have differences in expectations was estimated to exist. According to this, with a transparent procedure any cultural challenges shouldn’t exist. The language question is suggested to solve by using local employees that are able to communicate in a surrounding innovation environment. The electronic database should, however, be implemented in English as it is supposed to operate internationally. Generally, the whole system can be seen as a bridge between European Union and Russia.

9 CONCLUSIONS

South-East Finland and North-West Russia hold a significant possibility to increase their cooperation. St. Petersburg Corridor is a cooperation programme for South-East Finland, St. Petersburg, and the Leningrad Region which aims to enhance all the structures between these regions to eventually create a bridge between EU and Russia in the Northern Dimension. The programme operates through five workgroups from which one is innovation working group.

9.1 Cross-border innovation support

The main object was to identify further structures to implement the cross-border innovation support system for this region. The theory suggested further increasing of the cooperation and communication between industry, research organisations and public institutions. In addition, intermediaries were studied to promote the innovations in the system. Eventually, a theoretical framework for a cross-national innovation support platform was built.

Partly identifying of the structures and the roles of the actors turned out to be a complex thing. On the other hand, it’s good to have various actors to enhance more creativity but then again especially from the aspect of SME entrepreneur fragmented services can be confusing. Important issue proved to be improving the communication between the governmental actors and from them to the companies’ direction. The study proposes that information about the services that company needs to develop its ideas for commercial innovations could be found in from a one place. Further, in the Corridor Region established innovation centres are suggested to provide this information and additional financial support services which aims to match the ideas and the investors effectively in the region. Study suggests also some continuous services to be run in these innovation centres: technology support, IPR-services, InnoStudio and InnoTrade.

InnoTrade means actually brokering innovations and technologies. In the study were examined some existing innovation intermediaries and feelings towards brokering in the Corridor Region. The prevailing climate was to utilize existing structures and especially their experiences. One potential system could be expanding Innovation Relay Centres – operations to the Corridor Region and that way to start using the *Technology market place* as a tool in the innovation promotion process. However, this tool is not still a complete system and upgrading is needed to enforce its profile reaching wider visibility and use.

9.2 Discussion and Suggestions for Further Research

The study ended up suggesting a model for innovation supporting in the St. Petersburg Corridor Region. Various mechanisms of this model were distinguished some of those were more or less case-specific, such as InnoStudio. Additionally, the cross-border dimension was kind of unique in this case: Finland has been for years a western nation and Russia has been an eastern one. Therefore there are many cultural differences that had to be taken notice already in the planning stage of this research. Thus, the results of this research may not be valid applying in every other circumstance. For example in the Southern part of EU where the border is shared between to eastern nations the preconditions can be assumed to be different. The qualitative research provided an overview of the respondents' thoughts towards these promotion mechanisms. However, in other cases these opinions may differ based on the respondents' earlier experiences for example. In addition, should be taken notice the size differences of this case environment. St. Petersburg is size of Finland by its population. Thus, the cross-border environment is somewhat unequally fractured.

The study was strongly based on the innovation brokering. This business is relatively new and its profitability in a long run is still unknown. In the study was distinguished both public and private models of brokering. Public versus private naturally makes differences in their financing structures which can end up being a limiting factor in their operations. Thus, necessary would be to find how these models can operate in the long run, or even in a medium time period, and how it makes difference whether the service

is funded by government or a business model. Another dimension of research in the brokering mechanism could be integrating databases of universities and large companies to innovation brokering system that is eventually implemented in the region. Especially big companies may have a huge amount of unused ideas that could be utilised through other channels. In addition, higher the volumes in the database will grow there will be eventually an opportunity to apply various electronic data analysing tools such as data mining.

After the implementation of the innovation support services in the Corridor Region there may occur some challenges that were tried to find out in this study as well. However, because the studied mechanisms were relative new for this region the answers were mostly based on guessing what could happen instead of what happens. Thus, things like cultural barriers may be realized to exist after some use of the cross-border brokering. And these barriers may consist of many other cultural elements besides the language. In addition, the study was able to distinguish various factors to make the brokering system more credible. However, in practise the trust building process may need some further examining.

REFERENCES

Advanced Institute of Management Research (2004). I-works: *How high value innovation networks can boost UK productivity*. ESRC/EPSRC Advanced Institute of Management Research, London. 16 p.

Ansoff, I. (1957). Strategies for Diversification. *Harvard Business Review*, 35 (5). pp.113-124

Bass, F.M. (1969). A New Product Growth for Model Consumer Durables. *Management Science*, 16 (5), pp. 215-225.

Bergman, J. (2007). *Regional Open Innovation Platform*. Power-point presentation slides. [Internet document] [Accessed July 6th, 2007] Available at: <www.ec.europa.eu/regional_policy/conferences/competitiveness/doc/presentations/workshop1a/bergman_1a.ppt>

Bradley, F. (2002). *International Marketing Strategy*, 4th Edition. Pearson Education Limited. 417 p. ISBN: 0 273 65571 X.

Burgelman, R.A., C.M. Christensen, and S.C. Wheelwright (2004). *Strategic Management of Technology and Innovation*, fourth ed. Irwin Publishers, Chicago, IL. 1224 p. ISBN: 0072536950.

Bykov, D. (2007). *Innovation Activity in St. Petersburg*. Committee for economic development, industrial policy & trade. The Confederation of Finnish Industries EK [Internet document] [Accessed: October 4th, 2007] Available at: <http://www.ek.fi/www/fi/yritysten_kansainvalistyminen/liitteet/suomi_venaja_yhteistyokomissio/Bykov_280607.pdf>

Castells, M. and P. Hall (1994). *Technopoles of the World: The Making of Twenty-first-century Industrial Complexes*. Routledge, New York. 288 p. ISBN: 0415100143.

Chaudhuri, S. (2007) *Can Innovation Be Bought? Managing Acquisitions in Dynamic Environments.* Harvard University, Graduate School of Business Administration, George F. Baker Foundation. [forthcoming] 197 p.

Chesbrough, H. (2003a). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Harvard Business Press, Boston, Massachusetts. 227 p. ISBN 1-57851-837-7.

Chesbrough, H (2003b). The era of open innovation. *MIT Sloan Management Review,* Cambridge 44 (3), pp. 35-41.

Chesbrough, H. (2006a). *Open Business Models: How to Thrive in the New Innovation Landscap.* Harvard Business Press, Boston. ISBN: 1-4221-0427-3.

Chesbrough, H. (2006b). Open Innovation: A New Paradigm for Understanding Industrial Innovation. *Open Innovation: Researching a New Paradigm*. eds. Chesbrough, H., W. Vanhaverbeke and J. West. Oxford University Press, Oxford. 400 p. ISBN 0-19-929072-5.

Christensen, C.M. and M. Raynor (2003). *The Innovators Solution: Creating and Sustaining Successful Growth*. Harvard Business School Press, Boston, MA. 288 p. ISBN: 1578518520.

Chung, S. (2002). Building a national innovation system through regional innovation systems. *Technovation* 22 (8), 485-491.

Cooke, P. (1992). Regional Innovation Systems: Competitive Regulation in the New Europe. *Geoforum* 23, pp. 365-382.

Cooke, P. (1998a). Introduction: origins of the concept. *Regional Innovation Systems: The role of governances in a globalized world.* eds. H-J. Braczyk, P. Cooke and M. Heidenreich. UCL Press, London. ISBN 1-85728-690-1.

Cooke, P. (1998b). Global Clustering and Regional Innovation: Systemic Integration in Wales. *Regional Innovation Systems: The role of governances in a globalized world.* eds. H-J. Braczyk, P. Cooke and M. Heidenreich. UCL Press, London. ISBN 1-85728-690-1.

Cooper, R. (1990). State-Gate System: A New Tool for Managing New Products. *Business Horizons, Greenwich,* 33 (3), pp. 44-55.

Cooper, R., S. Edgett and E. Kleinschmidt (2001). Portfolio Management for New Product Develompent: results of an industry practices study. *R&D Management,* 31 (4), pp. 361-380.

Daft, R. and S. Becker (1978). *Innovation in Organization*. Elsezier, New York.

Daft, R. (1986). *Organization Theory and Design*, St. Paul, MN.

Damanpour, F. and W.M. Evan (1984). Organizational Innovation and Performance: The Problem of "Organizational Lag". *Administrative Science Querterly,* 29 (3), 392-409.

De Bruijn, P. and A. Legendijk (2005). Regional Innovation Systems in the Lisbon Strategy. *European Planning Studies,* 13 (8), pp.1153-1172.

Desai R.M. and I. Goldberg (2007). *Enhancing Russia's Competitiveness and Innovative Capacity.* Document of the World Bank. 187 p.

Eisenhardt, K.M. 1989. Building theories from case study research. *Academy of Management Review* 14 (4), pp. 532–550.

European Commission (2006). *A guide to SME policy*. [Internet document] [Accessed June 29th 2007]. 52 p. Available at: <http://ec.europa.eu/enterprise/smes/index_en.htm>

Ford, D., L.-E. Gadde, H. Håkansson, A. Lundgren, I. Snehota, P. Turnbull and D. Wilson (1998). *Managing Business Relationships*. John Wiley, Chichester. 280 p.

Frambach, R.T. and N. Schillewaert (2002). Organizational Innovation Adoption: A Multilevel Framework of Determinants and Opportunities for Future Research. *Journal of Business Research,* 55 (2), pp. 163-176.

Freeman, C. and L. Soete (1997). *The Economics of Industrial Innovation.* 3rd Edition. MIT Press, Cambridge, Mass.

Gassmann, O. (2006). Opening up the Innovation Process: Towards an Agenda. *R&D Management,* 36 (3), pp. 223-228.

Glaser, B. and A. Strauss 1967. *The Discovery of Grounded Theory: Strategies of Qualitative Research*. Wiedenfeld and Nicholson, London. ISBN: 0-202300285.

Geroski, P.A. (2000). Models of Technology Diffusion. *Research Policy*, 29 (4/5), pp. 603-625.

Gerstlberger, W. (2004). Regional innovation systems and sustainability – selected examples of international discussion. *Technovation* 24, pp. 749-758.

Haapaniemi, T. (2006). Cross-National Adoption of Innovations: The Effects of Cultural Dimensions on the Number of Adopters at Takeoff. *International Journal of Technology Intelligence and Planning*, 2 (3), pp. 263-274.

Hargadon, A. (2003). *How Breakthroughs Happen: TheSurprising Truth About How Companies Innovate*. Harvard Business Press, Boston, Massachusetts. 255 p. ISBN 1-57851-904-7.

Hirsjärvi, S. and H. Hurme (2001). *Tutkimushaastattelu: teemahaastattelun teoria ja käytäntö*. Yliopistopaino, Helsinki. 213 p. ISBN 951-570-458-8.

Holt, D.H. (2008). Entrepreneurship and Innovation. *The Strategy of Managing Innovation and Technology, 1st Edition* eds. Millson, M.R. and D. Wilemon. Pearson Prentice Hall. 986 p. ISBN: 0-13-230383-3.

Howells, J. (2005). Intermediation and the Role of Intermediaries in Innovation. *Research Policy,* 35 (5). pp. 715-728.

Howells, J. (2006). Innovation and Regional Economic Development: A Matter of Perspective? *Research Policy,* 34 (8). pp. 1220-1234.

InnoCentive (2007). [Internet document] [Accessed October 15th, 2007] Available at: <www.innocentive.com>

Innostudio (2007). [Internet document] [Accessed October 16th, 2007] Available at: <www.innostudio.fi>

Innovation Relay Centre (2007). [Internet document] [Accessed October 6th, 2007] Available at: <http://irc.cordis.lu/home.cfm>

Kalakota, R. and B. Konsynski (2000). The rise of neo-intermediation: The Transformation of the Brokerage Industry. *Information Systems Frontiers,* 2 (1), pp. 115-128.

Katz, R. and T.J. Allen (1982). Investigating the Not Invented Here (NIH) Syndrome: A look at the performance, tenure and communication patterns of 50 R&D project groups. *R&D Management,* 12 (1), pp. 7-19.

Koivuniemi, J. (2007). *Unpublished Report.*

Komulainen, K. (2007). *Innovation Support System in Finland*, Finnish-Russian SME working group meeting, Confederation of Finnish Industries EK. [Internet document] [Accessed October 6th, 2007] Available at: <http://www.ek.fi/www/fi/yritysten_kansainvalistyminen/liitteet/suomi_venaja_yhteistyokomissio/KomulainenKari_280607.pdf>

Kotler, P. (2000). *Marketing Management*, Millenium Edition. Prentice-Hall International. 718 p. ISBN: 0-13-015684-1.

Kotonen, T. (2007). *Regional Innovation Policy: Effect on SMEs in Five EU-Regions.* Lappeenranta University of Technology, Department of Industrial Engineering and Management, Research Report 180. 90 p. ISBN: 978-952-214- 350-1.

Körfer, H. and E. Latniak (1994). Approaches to Technology Policy and Regional Milieux – North Rhine-Westphalia. *European Planning Studies*, 2 (3), pp. 303-320.

Kuitunen, S., K. Haila and I. Kauppinen (2007). *IRC Finland teknologiansiirron instrumenttina: IRC Finlandin tehtävien, toiminnan ja tulevaisuuden kehittämistarpeiden arviointi*. Teknologiaohjelmaraportti 7/2007. ISBN 978-952-457-370-2.

Langhoff, T. (1977). The Influence of Cultural Differences on Internationalization Processes of Firms. *The Nature of the International Firm* eds. I. Björkman and M. Forsgren, Copenhagen: Handelshøjskolens Forlag. pp. 135-164.

Lecocq, X. and B. Demil (2006). Strategizing Industry Structure: The Case of Open Systems in a Low-Tech Industry. *Strategic Management Journal, Wiley*, 27 (9). pp. 891-898.

Leonard-Barton, D. and D. Sinha (1993). Developer-User Interaction and User Satisfaction in Internal Technology Transfer. *Academy of Management Journal,* 36 (5), pp. 1125-1139.

Leydesdorff, L. and H. Etzkowitz (1998). The Triple Helix as a Model for Innovation Studies. *Science & Public Policy*, 25 (3), 195-203.

Marques, J.P.C., J.M.C. Caraça and H. Diz (2006). How can university-industry-government interactions change the innovation scenario in Portugal? – The case of the University Coimbra. *Technovation,* 26 (4), pp. 534-542.

Martinez, E., Y. Polo and C. Flavián (1998). The Acceptance and Diffusion of New Consumer Durables: Differences between First and Last Adopters. *Journal of Consumer Marketing*, 15 (4), pp. 323-342.

Maula, M., T. Keil and J-P. Salmenkaita (2006). Open Innovation in Systemic Innovation Contexts. *Open Innovation: Researching a New Paradigm*. eds. Chesbrough, H., W. Vanhaverbeke and J. West, Oxford University Press, Oxford. 400 p. ISBN 0-19-929072-5.

Miles, M.B. and A.M. Huberman (1994). *An Expanded Sourcebook: Qualitative Data Analysis*, Sage Publications. 338 p. ISBN: 0-8039-4653-8.

Nilsson, D. (2007). A cross-cultural comparison of self-service technology use. *European Journal of Marketing*. *Bradford*, 41 (3/4) pp. 367-381.

NineSigma (2007). [Internet document] [Accessed October 16th, 2007] Available at: <www.ninesigma.net>.

Olson, E.M., O.C. Waker Jr. and R.W. Reukert (1995). Organizing for effective new product development: The moderating role of product innovativeness. *Journal of Marketing*, 59 (1), pp. 48–63.

Organisation for Economic Co-peration and Development (OECD) (2005). *Fostering Public-Private Partnership for Innovation in Russia.* 98 p. ISBN 92-64-00965-5.

Oske (2007). *Osaamiskeskusohjelma homepage*. [Internet document] [Accessed October 6th, 2007] Available at: <www.oske.net>

Porter, M.E. (2003). The Economic Performance of Regions. *Regional Studies*, Vol. 37 (6&7), pp. 549–578.

Psarev, G. (2007). *Co-operation Programme for South-East Finland, the City of St Petersburg and the Leningrad Region*. Power-point presentation slides. [Internet document] [Accessed July 6th, 2007] Available at: <www.lappeenranta.fi/includes/file_download.asp?deptid=15803&fileid=4667&file=Psarev.pdf&pdf=1>

Rogers, E.M. (1995). *Diffusion of Innovations, 4th Edition*. The Free Press, New York. ISBN: 0029266718.

Rothwell, R. (1972). Factors for Success in Industrial Innovations, Project SAPPHO – A Comparative Study of Success and Failure in Industrial Innovation, SPRU, University of Sussex, Brighton, UK.

Rothwell, R. (1992). Successful Industrial Innovation: Critical Factors for the 1990s. *R&D Management*, Oxford, 22 (3), pp. 221-240.

Saad, M. and G. Zawdie (2005). From Technology Transfer to the Emergence of a Triple Helix Culture: The Experience of Algeria in Innovation and Technological Capability Development. *Technology Analysis & Strategic Management*, 17 (1), pp. 89-103.

Saxenian, A.L. (1994). *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Harvard University Press, Cambridge, Massachusetts. ISBN: 0-674-75339-9.

Schilling, M. (2006). *Strategic Management of Technological Innovation, 2nd Edition*. McGraw-Hill Irwin. 336 p. ISBN 978-0-07-321058-2.

Scott, A.J. (1994). Variations on The Theme of Agglomeration and Growth: The Gem and Jewellery Industry in Los Angeles and Bangkok. *Geoforum*, 25, pp. 249-263.

Sivades, E. and R.F. Dwyer (2000). An examination of organizational factors influencing new product success in internal and alliance-based processes. *Journal of Marketing*, 64 (1), pp. 31–43.

Smith-Doerr, L., J. Owen-Smith, K.W. Koput and W.W. Powell (1999). Networks and Knowledge Production: Collaboration and Patenting in Biotechnology. *Corporate Social Capital*, eds. R. Leenders and S.M. Gabbay. Academic Publishers. 576 p. ISBN: 0792385012.

Terpstra, V. (1978). *The Cultural Environment of International Business*, Cincinnati, OH: Southwestern Publishing Co.

Tekes (2007). *Tekes Technology Market Place* [Internet document] [Accessed October 15th, 2007] Available at: <www.tekes.fi/partner/eng/index.htm>

Tidd, J., J. Bessant and K. Pavitt (2005) *Managing Innovation, 3rd Edition.* John Wiley & Sons Ltd. 582 p. ISBN: 0-473-09326-9.

Torkkeli, M, P. Ahonen and T. Kotonen (2007). Regional Open Innovation System as a Platform for SMEs: a Survey. *International Journal of Foresight and Innovation Policy* [forthcoming]

Törrö, M. (2007).*Global Intellectual Capital Brokering: Facilitating the Emergence of Innovations through Network Mediation*. VTT Publications. 106 p. ISBN 978-951-38-7001-0.

Van de Ven, A.H. (2008). Central Problems in the Management of Innovation. *The Strategy of Managing Innovation and Technology, 1st Edition* eds. Millson, M.R. and D. Wilemon. Pearson Prentice Hall. 986 p. ISBN: 0-13-230383-3.

Vanhaverbeke, W. and M. Cloodt (2006). Open innovation in value networks. *Open Innovation: Researching a New Paradigm*. eds. Chesbrough, H., W. Vanhaverbeke and J. West. Oxford University Press, Oxford. 400 p. ISBN 0-19-929072-5.

Verona, G., E. Prandelli and M. Sawhney (2006). Innovation and virtual environments: Towards virtual knowledge brokers. *Organization Studies*, 27 (6), pp. 765-788.

Viskari, S. (2006). *Managing Technologies in Research Organization: Framework for Research Surplus Portfolio*. Lappeenranta University of Technology, Department of Industrial Engineering and Management, Research Report 176. 76 p. ISBN: 952-214-294-8.

von Hippel, E. (1988). *Sources of Innovation*. Oxford University Press. 218 p. ISBN: 0-19-504085-6.

von Hippel, E. (2005). *Democratizing innovation.* The MIT Press. 204 p. ISBN 0-262-00274-4.

West, J., W. Vanhaverbeke and H. Chesbrough (2006). Open Innovation: A Research Agenda in Open Innovation. *Open Innovation: Researching a New Paradigm*. eds. Chesbrough, H., W. Vanhaverbeke and J. West. Oxford University Press, Oxford. 400 p. ISBN 0-19-929072-5.

Yaklef, A. (2005). Immobility of tacit knowledge and the displacement of the locus of innovation. *European Journal of Innovation Management*, 8 (2), pp. 227-239.

Yet2.com (2006). [Internet document] [Accessed October 16th, 2007] Available at: www.yet2.com

Yin, R.K. (1994). *Case Study Research – Design and Methods*. 2nd ed. Sage, Newbury Park, CA.

Zaheer, S. and A. Zaheer (2006). Trust across borders. *Journal of International Business Studies*, 37 (1), pp. 21–29.

Zaltman, G., R. Duncan and J. Holbeck (1984). *Innovations & Organizations*, Malabar, FL

Interviews

Juuso, H. (2007). Head of Innovation Relay Centre Finland. Phone interview September 27th, 2007.

Sievänen, P. (2007). Sales Assistant at Foundation for Finnish Inventions. Phone interview October 1st, 2007.

APPENDIX 1:

THE SURVEY DOCUMENTS

Appendix 1A: The cover letter

Appendix 1B: The questionnaire

APPENDIX 1A

Lappeenranta University of Technology

-Survey-

Dear interviewee,

We would like to thank you for participation in this survey about innovation promotion in St. Petersburg Corridor Region.

The data collected in the survey is used to produce further specifications for intended projects and to ground additional plans for the future. On the next page is provided a brief description of this survey and the St. Petersburg Corridor Programme in which it is related to.

We appreciate your efforts to provide the answers with your specialized knowledge. The responding is estimated to take your time approximately from 20 to 30 minutes.

Best Regards,

Marko Torkkeli
Professor of Technology and Business Innovations
Email: marko.torkkeli@lut.fi
Kouvola Research Unit

Hannu Käki
Research Assistant
hannu.kaki@lut.fi

APPENDIX 1A

Brief description of the St. Petersburg Corridor Innovation Workgroup: St. Petersburg Corridor programme itself consists of five different working groups: business collaboration and cooperation development, increase of innovation know-how and support innovation diffusion, welfare and tourist industry development, logistics and transportation network development, and environmental protection and development of environmental technologies.

Innovation Working Group aims to improve the cross-national innovation environment by concentrating on issues as e.g. intellectual rights, creating of technology centres with various services for enterprises. Innovation Promotion working package looks for to enhance the operation environment of enterprises and other innovation producers such as universities.

The primary objective of the interview process is laying the foundation for an adequate roadmap, which the international innovation promotion system should address and reflect. Key issues to be accomplished are

- getting an overall picture of the "innovation landscape" in the St. Petersburg Corridor region, both now and in the future,
- providing more precise specifications on how different mechanisms could operate
- gathering views on the risks, problems and other barriers that might appear

The interview is to be presented to a variety of actors from the both sides of St. Petersburg Corridor (Finland & Russia), preferably including members from all different parties involved in the innovation process (e.g. enterprises, academics, public organisations). Including different viewpoints can prove critical to uncovering the real problem spots in the innovation system and also provide fertile ground for innovative promotion work. The interview results are then used to formulate a free-form roadmap that states the St. Petersburg Corridor region’s current status as an innovation system, the goals of the new innovation promotion system and the mechanisms how to pursue the path to there, including further specifications of intended projects.

APPENDIX 1B

A. Overall Information

1. Which type of organization do you stand for?
    a. Company
    b. Public Organization
    c. University
    d. Other, please state (?):

2. Describe briefly the current state of your innovation environment. How innovative is the environment where you operate (*e.g. new products, patents applied, growth of companies, innovative ideas*)?

    a. What are the internal strengths and weaknesses of your company/region according to innovation capacity (*e.g. strong relations with universities or other research institutions, own R&D department, large R&D investment, capable employees*)?

    b. What are the external opportunities and threats (*e.g. human resources/other resources, investments made in the region/industry, financing*)?

APPENDIX 1B

B. International Innovation Network & International Commercialization

3. Which parties are most vital to be in the network and how the network is connected outside your area? Please describe how do you see the successful innovation network:

4. How should this innovation network be established in your area? Please name some actors/institutes and describe their roles:
    a. How should the innovations (including both ideas and innovations) be collected from different sources?

    b. How should the local network be connected outside your area?

5. What services are needed in your area to promote innovations? (*Mostly from aspect of promoting SMEs in international operations*)?

6. How should these services be established (*e.g. private vs. public / coordinated by one / various organisation(s)*)?

APPENDIX 1B

7. How regional parties, such as expertise centres, could promote innovations:
    a. How they can be seen as innovation brokers? (*searching for various markets and combining also nonobvious sources / searching the innovations and competence to fulfil companies needs*):

    b. Please describe possible challenges this kind of public brokering might face and try to provide some solutions to overcome those:

8. How trust can be built in innovation brokering (face-to-face meetings, contracts)? Please examine how trust building process could be made the most efficient and secured:

APPENDIX 1B

C. Innovation Database

9. Intended plan is to create electronic database for innovation collection system. Please state what are the possible advantages and disadvantages of the system?

10. What attributes do you suggest the database to include (*e.g. type of innovation, stage of the innovation, industry*)?

11. Please, describe the reasons why innovation producers wouldn't establish their results in the database:

12. Which methods could be used to motivate innovators to overcome these barriers? Please describe concrete mechanisms:

13. Are you willing to use/utilize the database?

APPENDIX 1B

D. Innovation Exhibition

Intended plan is to create continuous innovation exhibition. It is physical facility in the city of St. Petersburg where innovations are demonstrated.

14. What would be the most crucial elements of Innovation Exhibition?

15. What would be the most crucial elements of yearly Innovation Trade Show (established in Saint Petersburg Corridor Region)?

16. Please suggest a striking name for the Innovation Exhibition:

APPENDIX 1B

E. Cross-National Context

The innovation promotion system will be established in the cross-national environment in the St. Petersburg Corridor Region. When two or more cultures are mixed a possibility of cultural challenges to arise may exist. Also, many radical innovations are created in cross-cultural environment.

17. What kind of cultural benefits and challenges do you see to occur?
    a. In establishment of electronic innovation database:

    b. In organising the innovation network:

    c. In establishment of the innovation exhibition and trade show:

APPENDIX 2:

LIST OF THE SURVEY RESPONDENTS

APPENDIX 2

Aptual Oy, Kouvola

Industry:	Marketing and internet communications
Interviewee:	Sami Hänninen, Managing Director
Location:	Kouvola, Finland

City of Lappeenranta

Industry:	Government
Interviewee:	Hannu Äikäs, Administrative Officer, EU Affairs
Location:	Lappeenranta, Finland

Committee for IT and Communications, St. Petersburg

Industry:	Government
Interviewee:	Alexei Leonov, Adviser
Location:	Email interview

Crepidem Oy, Lappeenranta

Industry:	Advertisement agency
Interviewee:	Riku Kallioniemi, CEO
Location:	Phone interview

Cursor Oy, Kotka

Industry:	Regional development company
Interviewee:	Harri Eela, Project Manager
Location:	Phone interview

EU Project: Dissemination, Cooperation and Information Development of Internet Based Interactive Government to Business Services in Northwest Russia, St. Petersburg

Industry:	Government
Interviewee:	Igor Kuprienko, Key Expert
Location:	Email interview

Expert-Systema, St. Petersburg

Industry:	Software industry
Interviewee:	Yan Stolyar, Director on business developing
Location:	Email interview

Finpro, St. Petersburg

Industry:	Trade Centre
Interviewee:	Valery Sitnikov, ICT Project Manager
Location:	Email interview

Imatran Seudun Kehitysyhtiö Oy, Imatra

Industry:	Regional development company
Interviewee:	Ismo Pöllänen, Enterprise services manager
Location:	Phone interview

Innovation Technologies Centre of St. Petersburg State University of IT and Optics, St. Petersburg

Industry:	Research and Education
Interviewee:	Galina Stashevskaya, Chief expert on innovation projects
Location:	Email interview

Kouvola Region Federation of Municipalities, Kouvola

Industry:	Regional development company
Interviewee:	Harri Kivelä, Project Manager
Location:	Kouvola, Finland

Lappeenranta University of Technology, Lappeenranta

Industry:	Research and Education
Interviewee:	Jari Jumpponen, Project Manager
Location:	Phone interview

Miktech - Mikkelin teknologiakeskus Oy, Mikkeli

Industry:	Regional development company
Interviewee:	Vesa Sorasahi, Managing Director
Location:	Phone interview

N.N., Leningrad Region

Industry:	N.N.
Interviewee:	N. N.
Location:	Email interview

N.N., Leningrad Region

Industry:	N.N.
Interviewee:	N.N.
Location:	Email interview

Piako Oy, Pieksämäki

Industry:	Machine Building
Interviewee:	Harri Kovanen, Sales Manager
Location:	Phone interview

Propentus Oy, Kouvola

Industry:	Software Industry
Interviewee:	Mika Hall, Technical Development Director
Location:	Kouvola, Finland

Savonlinnan seudun kuntayhtymä, Savonlinna

Industry:	Regional development company
Interviewee:	Lasse Pulkkinen, Project Manager
Location:	Phone interview

South Carelia Polytechnic, Lappeenranta

Industry:	Education
Interviewee:	Jukka-Pekka Bergman, Senior Lecturer
Location:	Phone interview

State University of Aerospace Equipment, St. Petersburg

Industry:	Research and Education
Interviewee:	Alevtina Zjuban,
	Deputy of the first pro-rector on science and innovation
Location:	Email interview

St. Petersburg State University of Economics and Finance, St. Petersburg

Industry:	Research and Education
Interviewee:	Vladimir Platonov, Professor
Location:	Email interview

Technology Business Research Centre / Lappeenranta University of Technology, Lappeenranta

Industry:	Research and Education
Interviewee:	Jouni Koivuniemi, Development Manager
Location:	Phone interview

Technopolis Plc, Lappeenranta

Industry:	Technology center operator
Interviewee:	Antti Pätilä, Development Program Director
Location:	Phone interview

Technopolis Plc, Lappeenranta

Industry:	Technology center operator
Interviewee:	Tero Lehikoinen, Business Development Specialist
Location:	Lappeenranta, Finland