Research plan
Global Collaborative Product Development

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<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Current hot topics</td>
<td>3</td>
</tr>
<tr>
<td>Current projects</td>
<td>4</td>
</tr>
<tr>
<td>Research Questions</td>
<td>5</td>
</tr>
<tr>
<td>Methodological considerations</td>
<td>5</td>
</tr>
<tr>
<td>Preliminary results</td>
<td>7</td>
</tr>
<tr>
<td>Activities</td>
<td>8</td>
</tr>
<tr>
<td>Cooperation</td>
<td>8</td>
</tr>
<tr>
<td>Conference trips</td>
<td>8</td>
</tr>
<tr>
<td>International visits</td>
<td>8</td>
</tr>
<tr>
<td>Time plan</td>
<td>8</td>
</tr>
<tr>
<td>Milestones</td>
<td>9</td>
</tr>
<tr>
<td>Prior publications</td>
<td>9</td>
</tr>
<tr>
<td>Tentative publications</td>
<td>10</td>
</tr>
<tr>
<td>State of the art</td>
<td>10</td>
</tr>
<tr>
<td>Seminal papers</td>
<td>14</td>
</tr>
<tr>
<td>Environmental scanning</td>
<td>14</td>
</tr>
<tr>
<td>The research community</td>
<td>15</td>
</tr>
<tr>
<td>Key conferences</td>
<td>15</td>
</tr>
<tr>
<td>Leading research groups</td>
<td>15</td>
</tr>
</tbody>
</table>
Introduction

In the ever increasing global competition organizations are looking for new ways to decrease costs and gain innovation. For organizations involved in global product development of complex systems, these are the main challenges in order to stay competitive. Initially many companies started offshore development as a mean of decreasing costs, using their vendors for testing and maintenance. As the tasks are getting more complex, the cultural differences and working methods gets exposed. As the relation matures, advanced product development tasks are outsourced to the offshore development centre and the clients also start to demand innovative results. However, this requires a maturity and readiness from the clients’ side to open up towards the partner and share and communicate strategic information concerning the product. These are the issues that need to be considered to facilitate the collaboration in an efficient way. This paper describes different aspects that organizations involved in global product development of complex systems have to be aware of when moving up this scale from supplier relation to a strategic partnership, as well as considering other business models for Open Innovation. The study presented in this paper will explore the complexity in managing these collaborations that is not present in the literature, including managing collaborations that is transforming from a supplier relation towards partnership. In managing collaborations they need to facilitate learning within and between the organizations involved, as well as intercultural aspects. Utilizing Open Innovation also demands a readiness from the clients’ side to open up towards its supplier or partner.

The initial case study (Case X) was done at a European product development company (DU-EHTC) and at its Indian service provider (ISP). DU-EHTC has a number of different units in Europe that utilizes the same Offshore Development Center in India. The study looks closely at the evolvement of the collaboration from vendor/client relation towards a partnership with increased learning capabilities. The case study has a qualitative approach and included 40 semi-structured interviews taken place at both companies. The contributions of this paper are an understanding of the interface between the global telecom company and Indian Service Provider, as well as the increased complexity that occur when going from a well defined vendor relationship towards a partnership. This case will be followed up by a in depth study of DU-EHTC as well as another global product development company, benchmarking the different strategies and processes involved in the distributed product development to India.

The other part of my research focus on Open Innovation, or more precisely how to leverage on external competence on the boundaries of existing organizations. Case B is an example of how the industry in collaboration with the academia has taken the first step towards using “Open Innovation” by implementing a “Top talent”-program, where the recruitment of international students is combined with adjusting to the Swedish culture, Master level courses and working for a famous international company. The case is compared with Open innovation strategies implemented by a science park as well as a robotics cluster. Current literature and practice of open Innovation is
compared with the organizations practice of OI, through interviews with key informants and workshops with the companies involved.

This paper is a tentative description of my research so far, as well as a vision and plan on how to move forward. At this stage there is a lot of changes happening, which makes this paper difficult to write in a conventional manner. As the preliminary decision from the KK-foundation suggests that my project Effective Offshoring/Outsourcing of Research, Design & Engineering (RD&E) will be granted, this implies a big shift in the focus of my research. It also reflects on my lacking knowledge in what role I will take in the project, as well as focus and specific questions. In these last six months I have focused on another field of research: Open innovation. Development of a framework and strategy of implementing Open Innovation will still be a part of my research, but certainly to a smaller extent. Writing on a research plan is essential for me at this stage, though the lack of information and mix of areas will unfortunately not be a pleasant aspect for external readers...

Current hot topics
In the light of the recent recession, companies are struggling to stay competitive and try to find ways to develop innovative products and services at a low cost. The Swedish industry, as in many other countries, has to remain in the top of the value chain in order to keep the engineering jobs from moving to low cost countries such as India and China. The financial crisis influences many companies to focus on their core business and involve in cost cut projects, while hampering innovation and horizontal cooperation. The Swedish government invests in innovation promoting activities like clusters and other triple helix cooperation projects to strengthen research and industry. Even so, these regional investments have to stand in proportion towards the fact that Sweden, along with the rest of the western world, has less and less portion of the educated talents globally. Along with the demographics are changing towards an aging population, this makes the argument for collaboration even greater.

Fine and Whitney pointed out over a decade ago that today’s products are so complex that no one organization has all the necessary knowledge about the required product or process to completely design and manufacture them in-house. The problem of distributing RD&E activities across geographical and organizational boundaries can be treated as a special instance of the classical ‘make-buy’ problem. The entire question about make or by is a relatively big research area including several sub areas possible to scrutinize and analyze from different aspects.

Open Innovation (OI) is the latest trend explaining how to gain access to the global competence by different kinds of sourcing and outsourcing activities of knowledge, throughout the product development process (Chesbrough, 2003). Companies are increasingly opening up for external collaborations with customers (von Hippel, 2005), suppliers (Primo & Amundsen, 2002; Boutellier et al, 2008) and universities (Marques et al 2005; Sherwood and Covin, 2008), but also forming alliances with competitors as well as cross industry innovation. Van der Meer (2007) promotes the open innovation structure, since it provides mechanisms for importing and exporting knowledge, ideas and projects. These include structures, methods and systems in every stage of the innovation process which enables inflow or outflow. One dominant and important element that Chesbrough (2003) adds when describing OI is the flexible use of several business models. If a company develops and adopt additional business models when new opportunities occur, they can open themselves up to a larger range of moneymaking activities. My research will look into a new type collaboration model for
leveraging on the global competence, implementing Open Innovation practices within the framework of a company, connecting internal and external resources.

**Current projects**

I am currently working on two separate projects. They are somewhat overlapping in terms of researchers, theoretical background and company collaborations – but representing different aims.

*Effective Outsourcing/Offshoring of Research, Development, and Engineering*

The vision of the proposed research project is to find new ways to effectively distribute research, development and engineering work across organizational and geographical boundaries. The project proposal has been developed in close cooperation with two companies, ABB and Ericsson. The existence of a clear gap between the creation of an outsourcing/offshoring strategy, and its operationalization is recognized from both theory and empery. There is need for research that will support the identification of the requisite managerial and technical capabilities for managing outsourcing/offshoring relationships, and for creating usable tools and frameworks that will support strategy formulation and implementation.

The objective of the research project is to develop firm-specific theories of RD&E offshoring and outsourcing in Swedish organizations that enable more effective translation of organizational strategies into actual practice.

Through continued engagement in the case study sites, we will:

- Develop longitudinal descriptions that capture the evolution of practices.
- Create an organizational capabilities framework for distributing RD&E.
- Develop an assessment tool to enable organizations to determine effectiveness.

Our goal with the research is to address the understanding of the complexity associated with outsourcing and offshoring through the behavioral, dynamic, and technical lenses. This will allow us to develop firm-specific theories of outsourcing and offshoring. Most research is still carried out separated from operational realities. A key contribution of the research is the development of an engagement strategy that would support greater industry and academia knowledge of co-creation.

*Implementing Open Innovation – Collaborative Flexible Teams concept*

In this project I am working with my professor with the aim of developing a theory as well as industrial guidance on how to manage innovation projects at the boundary of the firm, which is carried through longitudinal case studies in three settings.

The newly awoken interest of Open Innovation has increased the need to clarify in what ways this theory can be put to practical use. Companies are asking for business models that they can use the benefits of Open Innovation, without necessarily opening up their whole product development process. The aim of this study is to develop a model for collaborative innovation in flexible teams. The purpose of this collaboration model is to create an inflow and outflow of ideas and talent, a new way of connecting regional strength to the top talents across the world. This model will:

- Clarify a structure for the collaborating actors
- Specify the prerequisites for creating flexible teams
- Specify in what senses the model will help users gain the global competence associated with “open innovation”
The Action objective is building an organizational structure for the use of flexible teams and global talent, which efficiently operates on the strengths of regional companies and collaborating actors.

The Research contribution is making open innovation into practice in a theoretical model that organizations’ can implement as a part of their project portfolios.

Research Questions
Preliminary questions include:
How and why do established firms participate in innovation and development projects outside their boundaries?
What strategies can established firms pursue to manage innovation outside?
What key factors may be identified and related to efficient execution of collaborative product development in:
   a) Outsourcing/Offshoring
   b) Open innovation?
In latter phases we will dig deeper into these issues, investigating: How can the design of the internal organization help companies to leverage on external collaborations in an efficient way?

Methodological considerations
Qualitative research is based on its inductive approach, where words rather than numbers are used to describe specific situations or people. They are especially suited for understanding the meaning of participants’ experiences, a particular context which they operate in, unanticipated phenomena or understanding the process by which actions takes place. Qualitative methods are also used to develop casual explanations, when explaining how factors relate, rather than investigating to what extent (Maxwell, 2005). These factors all make qualitative approaches suitable for the initial phases of the research project since it has an exploratory nature.

Triangulation means collecting data from a wider range of individuals and contexts, using different methods. Triangulation can be used as a strategy to reduce the risk for associations and systematic biases due to the choice of a specific method, in the same time improving the assessment of the generality of the explanations the study develops. If one think of what particular sources of bias and error that might exist, it is possible to develop specific triangulation of methods to deal with them (Maxwell, 2005). In order to avoid bias we will as often as possible combine interviews with e.g. observation and surveys to collect a richer and more reliable data. One should remember that sampling does not solely involve people, but also settings, events and processes. These parameters should be compared with the research questions, to make sure that the selection is representative and time-efficient to produce the answers. (Maxwell, 2005) In the Offshoring project we will use an initial survey to map the different projects to enable a sampling of cases according to specific factors.

Action research distinguishes itself from other research since it is not only observing, but also acting and influencing its environment with the aim to generate knowledge. It has a dual focus of both problem solving and research contribution, which put great demand on the researcher to position the research towards research programme as well as organizational needs. Action research involves a real time change process and should contribute to a learning process within the organization (Karlsson, 2009). An action-oriented approach will be used for some of the cases involved in the longitudinal studies of Open Innovation.
This study aims at developing a new model for Open Innovation collaborations. A model is a conceptual representation of all the factors that is incorporated in a relationship, an idealized image of a phenomenon where some aspects are emphasized while others are excluded (Holme & Solvang, 1997) A model should be a compromise of what is real and what can be manageable. A theoretical or conceptual model needs to be based on empirical results, unlike logical models which are the result of logical (mathematical) reasoning.

“Contributing to knowledge requires that there is an existing field of knowledge to contribute to” (Karlsson, 2009). This is a challenge for the area of interest in this study, since it touches a rather large amount of research areas, but in the same time is not fully described in any field. The literature study is therefore aimed at describing the areas that relate to any of the factors involved in the model, hence contributing to the pre-understanding of how to manage these kinds of issues. Relevant areas include Innovation Management, Open Innovation, Intercultural communication, project management etc. Literature review help establish the authority and legitimacy of the research, clarifying the contribution as well as constraining the research to a reasonable scope (Karlsson, 2009) The data analysis will depend on the stages of the research process. When analyzing the interviews a content analysis will be used. The latent content is analyzed by the appearance of themes as interpreted by the researcher (McBurney & White, 2007). In the case studies observation is a frequently used method, where the analyze is based on field notes. The reliability of the selected information is improved by using several observers who analyze the material. Analyzing the data from action research projects will look for themes to improve the model, evaluate the mistakes and inefficient aspects, as well as choosing pilot projects in collaboration with steering group.

These figures illustrate how the learning process from empirical studies will be used in the different projects.

**Figure 1.**
Research approach in Offshoring/Outsourcing project. Research learning process in OI project.
Preliminary results

An initial paper on implementing Open Innovation through Collaborative Flexible Teams has provided insight to three cases which are all focused on finding a flexible way of leveraging external competence by the temporal organizational units we call flexible teams. The points we want to highlight with this initial conceptual model is:

- Evolution of Open innovation – Organizations demonstrate motivation to involve in OI practices in their operations, but only, or at least initially, in the form of projects at the boundary of the firm
- Team level – As the initiatives to increase the strategic in- & outsourcing of expertise for development projects is developed, the main focus lie on team level, as long as it has managerial support.
- System perspective – In addition, we raise a system perspective to managing these CFT.
  - Organizational memory enabling mechanisms and people that make sure that the knowledge is kept within the system, that operations of collaborative flexible teams will benefit operations in the future
  - Open innovation capabilities represent a special set of features which organizations has to manage, from NIH-syndrome and culture to the structure of OI-initiative and the experience of handling crowdsourcing techniques.

Consequently, collaborative flexible teams emerges in the organizations as a way of introducing Open Innovation practices, though the focus of practice and goals may differ. As the organizations are learning in what ways they can leverage external expertise, the teams can be included in a larger system, or at least strategy. In future research we will continue to follow these cases and show how the implementation of OI practices can be supported by strategically implementing CFT on the boundaries of the firm. We will further look into how different management techniques as well as support structures can facilitate and increase the efficiency and success of CFT projects.

In a series of papers based on an offshoring case study, we have elaborated on the impact of cultural differences on the effectiveness of an offshoring relation. We have provided an overview of the cross-cultural issues to consider when managing offshoring between Sweden and India. The cultural factors have been divided in to two sets in our analysis. One set of factors that are manageable by the companies involved in the business relation and one set of factors that the companies only can relate to. This relates to the different perspectives presented on culture: Organizational culture, national culture as well as contextual factors. Managers can benefit from applying our framework within the context of their collaboration, thus providing the necessary information for developing a strategy to handle their offshore collaboration. This framework can be used in combination with the more traditional measures, such as the suppliers’ competence (technology and quality), and cost. Cultural understanding creates knowledge of each other’s strengths and weaknesses, thereby creating the ability to form and organize for the largest potential efficiency in collaborations.
Activities

Cooperation
At present, I am the only researcher focusing on companies’ external collaborations within product development and innovation. This makes it even more important to engage in different types of collaborations external to this department. I am collaborating with the research group of Business Oriented Engineering of Software Intensive Systems (BESS) sharing the industrial perspective and expertise. The financing of the offshoring project makes it possible to hire a Ph D from MIT, Jayanankh Srinivasan, which will provide greater knowledge within offshore outsourcing. Discussions are also taking place about collaborating with a Ph D student at Aalborg University, Mohamed Niang, which I met at the DIME conference in April. His focus on “structures and infrastructures of International R&D networks” has large intersections with the Offshoring project we will be starting shortly. We have discussed the possibility of writing a paper comparing Danish and Swedish companies in terms of offshoring strategies. I intentionally keep in contact with the participants from the EIASM summer school which I attended last fall, in order to scan for possibilities of future collaborations as the intersections present themselves. The same applies for the national research school PIEp (KTH, Lund, Jönköping, Luleå, etc.) which I am taking some courses at to develop both knowledge and networking on Swedish Innovation research. Linked In groups created for different conferences are another effort to keep up to date with the research network.

Conference trips
I attended the International Product Development Conference in Twente last year, and will be attending this year’s conference in Murcia next month. This conference is organized by European Institute of Advanced management Studies (EIASM), which also organized the summer school and the Asian Management and Entrepreneurship workshop which I attended last fall. For next year’s paper strategy I will focus on conferences which have related Special Issues or publications, such as the PICMET conference for IEEE publication.

International visits
I intend to complete at least one international visiting period during the Ph D project. The conferences provide a great platform for finding professors with relevant expertise and availability for visiting later in the project. The offshoring/outsourcing project also provides possibility to gain insight into the industrial problems by visits in combination with the data collection planned.

Time plan
Effective Outsourcing/Offshoring of Research, Development, and Engineering
Sometime after summer there will be the official startup of the project which includes defining and planning the work packages and its outcomes, forming a steering committee and reference groups for the separate case studies. Based on the pilot workshops, we will design an organizational survey that will be sent out to key stakeholders in both partner organizations.
Main outcomes 2010:

- Two organizational baselines published as individual reports
- Six project-level case studies written up as case reports
- Cross-Case Analysis Report
- One senior leadership briefing
- 2 Study Champion meetings

Implementing Open Innovation – Collaborative Flexible Teams concept

This project has a more ad hoc approach; it will run as a longitudinal multiple case study during the next few years. Whether we will continue the study of all three cases depends on their development, and the data collection will form the same pattern. The focus of this project will depend on the financing as well as my professors’ possibilities to devote time to the project.

**Milestones**

Milestones include the presentations of accepted papers at the conferences, first accepted article for journal as well as the funding of the projects. Other milestones are of course the Licentiate proposal (Dec 2010) and Licentiate thesis (Dec 2011).

**Prior publications**

Edoff P., Norström C., Boivie Y., (2009), Managing Offshore Development- an Intercultural Perspective. 16th IPDM Conference, Twente

Tentative publications
As part of a Journal writing course organized by the Innovation research school PIEp, the paper on collaborative flexible teams will be rewritten and expanded for a journal and submitted this fall.

Planned paper on the case studies within offshore outsourcing project on ABB/Ericsson as well as longitudinal on Collaborative Flexible Teams (CFT) concept.

State of the art
The newly awoken interest of Open Innovation has increased the need to clarify in what ways this concept can be put to practical use. Companies are asking for business models that they can use to benefit from Open Innovation, without necessarily opening up their whole product development process. The trick is to increase the amount of relevant accessible expertise, but in the same way keeping the flexibility in the product development projects. Even though the different types of collaboration modes are known by the companies, the Intellectual Property Rights (IPR) issues and Not Invented Here-syndrome (Katz & Allen, 1982) combined with overall strict company strategies can hamper the success in development projects. There can be several reasons why the existing methods do not result in successful projects. The idea or technology is not seen as core business, or fit into the existing product portfolio, a lack of expertise in the area within the organization or limited knowledge on sourcing external competence. Alliances or partnerships may be seen as longer term and strategic investments, which limits their use in everyday business. In any case, companies must rely on their ability to find the right competence and resources to suit their needs, in time, and at low cost. Open Innovation is one way of looking at this challenge, which we will give some examples on how to organize in practice, but first we need to get a sense of the different collaboration modes frequently used today. We will use the general term “the crowd”, to describe all the different stakeholders and potential resources that exist outside a company’s boundaries. The crowd can consist of suppliers, customers, lead users, universities, web communities, programmers, clusters, competitors et cetera. The important thing is not to include all the potential stakeholders, but to take a strategic approach to what resources to use, and make sure that it consists of the most appropriate competence available. In order to focus on core competence, one needs to make sure that the noncore activities are also performed in the best possible way.

There are different ways of considering collaboration modes. One can see it from a stakeholder perspective, as mentioned above, where the type of actors involved will set the tone of collaboration. One can see it from a system perspective, considering the overall background to how the collaborating actors meet and their joint perspective originate from, such as networks, clusters and Science Parks. There are also different hierarchal levels of collaboration to consider. Does the collaboration mode change the structure of the company as a whole; is it connected to a single division, a project, or even a person? Is it formal or informal bonds which tie the collaborators
together? Generally, these different modes are separated as a part of the limitations, but to prove our point on the need for a more flexible way of collaborative innovation and development projects, we will give a short description of them all.

<table>
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<th>Mode</th>
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<tr>
<td>Acquisition</td>
<td>A company acquires another company in order to access a technology (or technological competence) of interest.</td>
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<tr>
<td>Educational acquisition</td>
<td>A company recruits experts in a certain technological discipline or acquires a smaller company in order to obtain people familiar with a certain technological or managerial competence.</td>
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<tr>
<td>Merger</td>
<td>A company merges with another one that possesses a technology (or technological competence) of interest, and a new company emerges from the two existing companies.</td>
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<td>Licensing</td>
<td>A company acquires a license for a specific technology</td>
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<td>Minority equity</td>
<td>A company buys an equity in the source organization in which a technology (or technological competence) of interest is embedded, but does not have management control.</td>
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<tr>
<td>Joint venture</td>
<td>A company establishes a formal joint venture with equity involvement and a third corporation is created with a definite objective of technological innovation.</td>
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<tr>
<td>Joint R&amp;D</td>
<td>A company agrees with others jointly to carry out research and development on a definite technology (or technological discipline) with no equity involvement.</td>
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<tr>
<td>R&amp;D contract</td>
<td>A company agrees to fund the costs of R&amp;D at a research institute or university or smaller innovative firm for a definite technology.</td>
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<tr>
<td>Research funding</td>
<td>A company funds exploratory research at a research institute or university or small innovative firm to pursue opportunities and ideas for innovation.</td>
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<tr>
<td>Alliance</td>
<td>A company shares technological resources with other companies in order to achieve a common objective of technological innovation (without equity involvement).</td>
</tr>
<tr>
<td>Consortium</td>
<td>Several companies and public institutions join their efforts in order to achieve a common objective of technological innovation (without equity involvement).</td>
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<tr>
<td>Networking</td>
<td>A company establishes a network of relationships, in order to keep the place in a technological discipline and to capture technological opportunities and evolutionary trends.</td>
</tr>
<tr>
<td>Outsourcing</td>
<td>A company externalizes technological activities and, then, simply acquires the relative output.</td>
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Table 1: Organizational modes for technological collaboration as adopted from Chiesa et. al. (2000).

Visser (2009) observes four types of inter-firm interaction; pure spillovers, price negotiation in markets, relatively stable subcontracting agreements between vertically or horizontally specialized supplier and clients, and network relations between cognitively different actors which need external input for innovation processes. Collaborating with suppliers is possibly one of the more traditional and frequently used collaboration modes today. There is a whole stream of Supply Chain Management literature (Jonsson, 2008). The use of consultants can provide a more specialized and/or flexible way to gain expertise and workforce. As the companies increasingly compete on a global arena, choosing the right partner is essential. Goldbrunner et al (2006) claim that organizations benefit when they configure their supplier network for cost and manage them for value. Offshore Outsourcing (offshoring, offshore development centers), is one of the solutions that companies use to reduce costs by the suppliers’ economy of scale and lower wages (Bengtsson et al, 2009). Another reason to outsource is for strategic motives, to gain access to the local market (Goldbrunner et al, 2006; Mao et al. 2008), or to gain access to new technology, competence and innovation (Bengtsson et al, 2009). Brown (2005) defines that “Offshore outsourcing, or offshoring, refers to the procurement of goods or services by a business or organization from an outside foreign supplier, typically to gain the benefits of labour arbitrage” (Brown, 2005, p vii). Initially many companies started offshore development using their vendors for testing and maintenance. As the relation matures, advanced product development tasks are outsourced to the offshore development center and the clients also start to demand innovative results. However, as the tasks are getting
more complex, the cultural differences and working methods get exposed. These are the issues that need to be considered to facilitate the collaboration in an efficient way.

Current research has identified several factors for successful outsourcing, including: Supplier competence in technology and quality control (Boutellier et al, 2008; Primo & Amundson, 2002), Interface management and communication (Boutellier et al, 2008; Primo & Amundson, 2002; Van Looy et al, 2005), Amount of direct interaction with supplier (Primo & Amundson, 2002), Legislation and contracts (Mao et al, 2008), Nature of supplier involvement (Primo & Amundson, 2002; Clark, 1989), Trust (Ferrie et al, 2008; Sherwood & Covin, 2008; Mao et al, 2008; Doney et al., 1998) and the maturity of collaboration (Sherwood and Covin, 2008). A lot of research has been done in intercultural aspects in business (Trompenaars, 1997; & Hofstede, 2005, Adler & Gunderson, 2008), however current research has to a limited extent addressed the cultural aspects on efficient outsourcing in product development. Long distance cultural collaborations put a greater demand on all these factors, not only to manage but to understand the underlying patterns that guide the behavior as well as efficiency in the projects. In the past 10 years, a large amount of outsourcing contracts have increasingly been awarded to firms in developing countries, because educated workers in these countries (India and China in particular) are willing to work for a much lower wage (Brown, 2005). While the clients of outsourcing are concentrated in North America, Western Europe and Japan, India has been the leading destination (Mao et al. 2008). But while the Western clients seem to fall too easily for the argument that, in a globalized world, distance, borders and place no longer matter. This is contrasted by the study on Global Software Outsourcing (GSO) by Heeks et al (2001). “Players in this global game still retain cultural values rooted in a particular locale. The overseas development center is a powerful tool for synching and, thus, for raising project success rates and moving up the GSO value chain, but it has its limits. Western processes, systems, capabilities, and so forth can all be imposed. However, some cultural “stains” underpinning these dimensions are hard for this global tide to wash away. Clients must learn to live with this” (Heeks et al, 2001, p. 59).

Alliances and joint ventures between two or more actors is a strategic form of collaboration on technology and innovation. The relations a company forms is part of a larger system. Gulati (1998) describes how firms can be interconnected with other firms in different types of social and economic relationships, and each of them can consist of a social network. The social networks can include supplier relationships, resource flows, trade association affiliations, relationships between individual employees as well as prior strategic alliances. Networks can be used as a knowledge pool on many levels. “Networks refer to dynamic cooperation in the form of knowledge exchange between firms and other actors that may, but need not, develop these links at the local or regional level” (Visser, 2009). Network behavior entangles to interact with other actors with the intent to transfer information, to exchange views on different types of knowledge and making new combinations. It is thus a relational process. Research on networks can be considered a well established area when connecting it to the management of supplier and buyer relationships (Möller & Halinen, 1999), but it can also be seen more in terms of knowledge exchange (Visser, 2009) and explain more superficial levels of interaction. The streamlined supplier networks where each member contributes in its specialized core competence is a result of total quality management. Möller & Halinen (1999) describes four levels of network management; Industries as networks, firm in a network, managing relationship portfolios and managing exchange relationship, as a framework for discussing network
management capabilities. Specific attention has also been given to the concept of Innovation networks (Pyka & Küppers, 2002).

When a network consists of larger group which are interacting and usually geographically condensed it can be described as a cluster, the most well known cluster being Silicon Valley. Conceptually, networks reflect on institutional arrangements of firms with strong ties, while clusters can be described as institutional environment with weaker ties in a social context based on cluster-specific institutions. While companies can mitigate input-cost disadvantages through global sourcing, but the competitive advantage lies in making productive use of inputs by continuous innovation (Porter, 1998). Porter define cluster as “geographic concentrations of interconnected companies and institutions in a particular field” (1998, p. 78). They often relate to linked industries as well as governmental institutions, universities and think tanks. Clusters represent a new form of spatial organization, in between related markets as well as vertical integration - thus an alternative way of organizing the value chain. Repeated exchanges among the members foster a better coordination and trust. Porter states several advantages for companies involved in clusters:

- Better access to employees and suppliers
- Access to specialized information
- Complementarities (in meeting customer needs and marketing)
- Access to institutions and public goods
- Better motivation and measurement through the local rivalry
- Good possibilities to experiment and implement innovations as well as support for new business formation.

Networks or clusters taken to a more organized and permanent level can be seen in the popular establishments of Science Parks, traditionally with a science and technology focus. This spatial form of inter-firm relation has been described as a policy-induced co-location of firms (Visser, 2009). Sourcing for competence should of course preferably start within the organization, and there is research focusing on how product development teams should advance their outlook for external competence and increase the flexibility in organizing their work (see Ancona & Kaeufer, 2002) The trend of conducting business through virtual organizations has got attention by many researchers (Bitici et al, 2004; Browne & Zhang, 1999; Chesbrough & Teece, 2002). The question is when to go virtual and when to rely on internal organization. Chesbrough and Teece (2002) argue that the decision should be based on type of innovation being pursued – autonomous or systemic in nature. Autonomous innovations can be managed quite well in development and commercialization. The way collaboration is managed on team level has also received increasing attention, eg how to manage virtual R&D teams (Gassman & von Zedtwitz, 2003). A related concept is Extended enterprise, “a knowledge-based organization, which uses the distributed capabilities, competencies and intellectual strengths of its members to gain competitive advantage to maximize the performance of the overall extended enterprise” (Bitici et al, 2004 p. 259), compared to the virtual
enterprise which is seen as temporal (Bitici et al, 2004; Browne & Zhang, 1999). Crowdsourcing is a term that represents the other extreme, using the crowd as a metaphor for leveraging on everyone on earth that might have an idea or competence to evaluate a company’s problem. Crowdsourcing are often promoted and supported by intermediaries, the most well known being innocentive.com. These intermediaries provide “innovation marketplaces” for companies to interact with “the crowd”, usually through open call idea competitions or contacts with gurus (eg. Gurustorm.com), which is researchers, specialized in certain areas. Crowdsourcing has recently been used to describe the potential of user involvement in innovation (Stewart and Hyysalo, 2008), building on the research on lead users (von Hippel, 2005). User innovation and its connection to the Open Source Software movement has also caught the interest of management scholars (eg. Von Hippel & von Krogh, 2003).

Seminal papers
Within innovation research, it all started with Joseph Schumpeter’s description of the competitive strategies of entrepreneurs in his 1950’s book *Capitalism, Socialism and Democracy*. Even though these sources might be interesting to relate to in a thesis, finding initial papers is difficult in this interdisciplinary subject, since it all relate to common issues but in different journals and with the use of different words and concepts. Within Open Innovation however, the person who coined the concept is Henry Chesbrough, with his book *Open Innovation* from 2003. Within my other focus area, outsourcing, different perspectives seems to limit the extent to which researchers build onto eachothers knowledge. One of the more cited papers is *Strategic Outsourcing* by James Brian Quinn and Frederick G. Hillmer from 1995. They address the concept of managing the company’s core competencies within the company and strategically outsourcing other activities. Since then, the most extensive research on outsourcing and offshoring is within the IT-industry (eg. Heeks et al, 2001)

Environmental scanning

*State of Practice - Key Industrial Players*
Outsourcing is probably one of the most used types of external collaborations. As the suppliers increasingly reside in different countries (and even continents), managing suppliers becomes more difficult. The organizations are also becoming more distributed, relying on their subsidiaries or R&D departments spread out around the world. The struggle hence lies in managing the interface to other departments both within and outside the organization when managing the product development process. ABB & Ericsson is two of the more prominent players in Sweden which use these different types of distributed development, and relying on offshore development both for parts of their product and entire segments of business. ABB & Ericsson will be used in exploratory case studies within the offshore outsourcing research project. Our partners at Ericsson has communicated the lack of strategy that often is involved in outsourcing at the companies, where the contracts are awarded due to the preferences of the current manager and changing destinations ad hoc. Another issue is how to manage offshoring in comparison with outsourcing – where there are similar challenges but not as much acceptance for demanding procedures. At ABB there is a big amount of offshoring of development which creates specific issues as well as frustration and feeling of insecurity with the employees.

Procter&Gamble is maybe the most famous example of companies taking the next step towards leveraging on external expertise, and collaborating with customers. They have branded the initiative as “connect + develop” and constantly post new interests in products or solutions for the crowd to
develop on their website. Kraft foods has taken a similar approach with their website (innovatewithkraft.com) and in Sweden SCA has been using Innocentive for solving their problems concerning their personal hygiene products. The problem gets exposed when the collaborative ingredient of “Open Innovation” collaborations increase. Scania and Ericsson would exemplify two companies which are starting to seriously consider including Open Innovation practices in their product development process, but since their products are highly complex and the Intellectual Property Rights (IPR) issues are driving forces of the development as of today. In the research regarding implementation of Open innovation, several intermediary platforms will be used during the projects, and evaluated in comparison with the objectives of the projects further on.

**Type of Technology available**
Intermediary innovation platforms such as Innocentive (innocentive.com), Innovation Market Place. Knowledge Management Systems for managing virtual teams. These are related to, but not central to the research.

**The research community**

**Key conferences**

IPDMC – International Product Development management conference organized by EIASM. EIASM workshops such as this one and their summer school is the only conferences I have been to so far, they seem relevant and has a good atmosphere for networking. http://www.eiasm.org/frontoffice/event_announcement.asp?event_id=625#2053


IAMOT – International Association of Management of Technology


ISPIIM – International Society of Professional innovation Management

http://conference.ispim.org/index.php

IEEE – ICMIT International Conference on Management of Innovation and Technology


**Leading research groups**

*The DIME network* has a conference on Networked innovation in which I hope to find some new theoretical insights to my research. DIME stands for Dynamics of institutions and markets in Europe. Mats Magnusson from KTH is one of the organizers, and he seems to be one of the researchers closest to my field of research in Sweden.

*Eric Von Hippel*, Professor of Technological Innovation in the MIT Sloan School of Management, is a well established guru which has been doing research for 30-something years, mainly on user innovation but also innovation in collaboration with suppliers and other actors. (http://mit.edu/evhippel/www/)
University of Cambridge, Institute for Manufacturing, has an Open innovation initiative that I keep an eye on, were they seem to include some concept which I find lacking in the research area overall.

Henry Chesbrough Adjunct Professor and Executive Director, Center for Open Innovation Center for Open Innovation, Management of Technology at Haas School of Business, Berkely. The original Open Innovation guru, which I always need to reference to, even though I use another interpretation of the concept. [http://www2.haas.berkeley.edu/Faculty/chesbrough_henry.aspx](http://www2.haas.berkeley.edu/Faculty/chesbrough_henry.aspx)

Mack Center for Technological Innovation at Wharton university of Pennsylvania has focus on Innovation networks, which I need to look into further on. [http://mackcenter.wharton.upenn.edu/Agenda2009.06.05.InnovationNetworks.aspx](http://mackcenter.wharton.upenn.edu/Agenda2009.06.05.InnovationNetworks.aspx)

Duke Center for International Business Education and Research (CIBER) at Duke University, The Fuqua School of Business, has a Offshoring Research Network (CRN) has an interesting focus, even though there are no events posted on the website for this year, I will look into the material and the company collaborations available. I can see that they have Scandinavian partners posted from Copenhagen Business School, contacting them can be an interesting way to get into the area. [http://offshoring.fuqua.duke.edu](http://offshoring.fuqua.duke.edu)
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