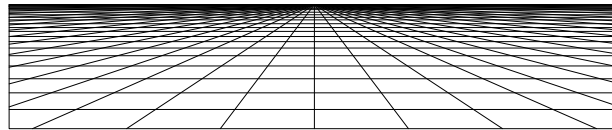




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Alliances in User-driven Innovation Projects -  
A study of the interaction between industry and academia

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## Abstract

The aim of this thesis is to investigate what characterises the interaction between firms and research institutions forming alliances in User-driven Innovation Projects.

User-driven research aimed at promoting innovation is considered an area of priority for the Norwegian Government. One of the main instruments for distributing financial support stimulating increased R&D in business and industry is the User-driven Innovation Project, administered by the Research Council of Norway. Projects initiated under this instrument frequently entail the formation of an alliance between a firm and an academic research institution, i.e. a university or a research institute.

Since the mid 1990's the Research Council of Norway has financed systematic investigations of the measurable economic effects and success of these projects. However, the processes and social circumstances surrounding the alliance formations and relations embedded in the projects have not been subject to the same systematic scrutiny. The focus of this thesis is to explore the interaction and relations that exist, or are established, between organisations in this context.

This thesis is a qualitative exploratory study of six recently established projects, including a closer examination of both the motivation and the circumstances surrounding the establishment of the alliance and the relation. Thus, some of the factors that characterize the interaction between the players are identified. The projects are examined in light of Ranjay Gulati's concept of network resources and Mark Granovetter's ideas on strong and weak ties.

**Keywords:** User-driven research, innovation, interaction, alliances, R&D partnerships, network resources, user-driven innovation project



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## List of abbreviations

BIP	User-driven Innovation Project, application type used by the RCN
IPR	Intellectual Property Rights
NIS	National Innovation System
NTNF	Norwegian Research Council for Scientific and Industrial Research (until 1993)
RCN	The Research Council of Norway (from 1993)

# 1. Introduction

The “knowledge based economy” is a term used to describe how the production of and access to knowledge plays an essential role in most advanced economies today. At the core of this knowledge based economy is *innovation* (Oslo Manual, 2002). User-driven research aimed at promoting innovation is considered to be an area of priority for the Norwegian Government and the Norwegian agency allocating the main bulk of public research funds, the Research Council of Norway (RCN). One of the main instruments for distributing financial support aimed at stimulating increased R&D in business and industry is the User-driven Innovation Project. The Norwegian abbreviation for the User-driven Innovation Project is BIP (Brukerstyrt innovasjonsprosjekt). The RCN uses the same abbreviation in English and therefore I will adopt this practice in my thesis. Projects initiated under this framework frequently entail the formation of an alliance between a firm and an academic research institution, i.e. a university or a research institute.

Since the mid 1990’s the Research Council of Norway has financed systematic investigations of the measurable economic effects and success of the BIP projects (Hervik et al., 2009). However, the processes and social circumstances surrounding the alliance formations and relations embedded in the BIP projects have not been subjected to the same systematic scrutiny. The focus of this thesis is to explore the interaction and the relations that exist or are established between organisations in this context.

Through a qualitative exploratory study of six recently established projects I will try to isolate some of the factors that characterize the interaction between the players when a partnership is formed under the framework of a User-driven innovation project. This includes examining both the motivation and the circumstances surrounding the establishment of the alliance and the relation.

## 1.1 Empirical context

According to the most recent Report to the Storting on Norwegian research (White Paper to the Norwegian parliament), research based innovation in business and industry is of profound importance for making Norway one of the leading, dynamic, innovative and knowledge based economies in the world (Ministry of Education and Research, 2009). A

separate report on innovation also highlights the importance of research as a crucial factor in innovation and value creation processes, and the Government's role in promoting research and development in business and industry (Ministry of Trade and Industry, 2008).

The Research Council administrates several instruments for stimulating R&D in business and industry: the most important ones listed at the RCN's web site is the tax deduction scheme SKATTEFUNN, knowledge building projects with user involvement, the recently established PhD-programme for business and industry and of course, User-driven Innovation Projects, which is the focus of this thesis ([www.forskningradet.no](http://www.forskningradet.no), 2009). The main intention of publicly funded user-driven research is that the *users*, in this respect business and industry, are intended to initiate, govern and partly finance research activities, thereby ensuring that the research performed is relevant and that the results are put to good use, i.e. developed into a product entering the market. The users decides where to focus their R&D effort and set the agenda (NOU 2000:21, Hervik and Waagø, 1997). Historically, the phrase "user-driven research" in Norwegian context was coined at the start of the 1990's, in what was then known as the Norwegian Research Council for Scientific and Industrial Research (NTNF). Though the term was new, the NTNF had already in the late 1960's established a scheme ensuring that the firms themselves be granted increased control of a share of the public R&D allocations (Ministry of Trade and Industry et al., 2000).

Upon contacting the RCN looking for ideas to a master thesis, I was presented with a list of projects that the Division for Innovation was currently considering. One of the points high up on the agenda was a closer examination of the User-driven Innovation Projects. One fundamental feature of such projects is that they are supposed to originate in the firm's strategy and R&D needs. However, the firms of these projects frequently enter into formal alliances with research institutions. "Research institutions" in a Norwegian context means either a university or one of the many independent research institutes. The independent research institutes are annually granted some basic funding from the RCN, but the main part of their income has to be derived from research performed for business and industry or the public sector. The RCN's concern in this respect was to find out where the ideas for such projects really originate and whether the research institutions are particularly active in suggesting and writing projects proposals. And if so, would this have any consequences for the quality or relevance of their BIP project portfolio? This was a subject that caught my interest and the starting point for developing the research objective of this thesis. However, an investigation entirely focused on the origin of the project seemed like a somewhat narrow

approach. Therefore I decided to dig deeper into the circumstances surrounding the origin of a project and develop an investigation that was focused on the *interaction* between the partners that choose to enter into a formal alliance under the BIP framework.

Thus, my aim is not to explore the economic effects of such projects, nor to evaluate the results of the projects. I will try to explore and identify some of the most significant elements and important circumstances in the process of establishing a User-driven Innovation Project and the factors leading up to the decision to enter into a formal partnership. This has led me to the following research question:

*What characterises the interaction between a firm and a research institution in the process leading up to establishment of a User-driven Innovation Project (BIP)?*

In order to answer this research question, it is necessary to explore the origin of the ideas and the choices behind the establishment of the alliance and the manner in which it is established, as well as the nature and quality of the relation itself. By making the interaction the object of investigation, the goal is a “thick description” of how the forming of partnerships and projects take place. In answering the research question, I will adopt a qualitative approach, using an exploratory case study.

## 1.2 Theoretical foundations

The empirical data gathered in interviews and document studies will be analysed in light of relevant theoretical concepts. First of all it is quite a challenge to understand what kind of relation or alliance one is dealing with in this kind of instrument, since a relation may be known under different aliases: strategic alliance, R&D collaboration, strategic technology partnering, inter-firm or inter-organisational collaborations etc. How you choose to categorize and label such a relation might also influence the way you perceive its origin, as it were.

It is possible to draw on theories from a number of different fields when investigating inter-organisational collaboration, underlining the innate cross-disciplinarity of studies aiming at understanding the complexity of innovation. In the analysis of the empirical data I will mainly rely on concepts developed by Ranjay Gulati and Mark Granovetter. Ranjay

Gulati has developed a concept he calls network resources, building on an expanded resource based view of the firm. His project is to provide a conceptual framework that allows for the analysis of an organisation's resources originating in existing and potential networks and co-operative ties and how these relations influence choices, behaviour and economic action. He introduces a broader approach to network resources which incorporate ties to customers, suppliers, alliance partners and internal subunits. His theoretical framework will be a backdrop to understanding how firms and research institution perceive the landscape surrounding them, the social context in which they are embedded, how and why they engage in alliances, and why they choose one partner over another (Gulati, 2007). In combination with this, I will draw on Mark Granovetter's seminal article "The Strength of Weak ties" in analysing one aspect of the relation. Here, Granovetter highlights the importance of weak ties as conduits for *novel* information, a concept which is central to the idea of innovation. (Granovetter, 1973).

## 1.3 Relevance

Why is this subject interesting? The last two Reports to the Storting on research and innovation underlines the importance of stimulating research in business and industry as a basis for innovation and future growth. The belief in user-driven research and BIP as an instrument has manifested itself in increased allocation of funds from the ministries to programmes which use this instrument and this will be an area of priority in the future as well (Ministry of Trade and industry, 2008). In 2009 the total budget of the RCN is approximately NOK 6 400 million. Of this, approximately NOK 1 000 million was allocated to BIPs, and further approximately NOK 700 million were allocated to knowledge building projects with user involvement. In other words, user-driven research, and particularly an instrument like the BIP is an important as well as large part of the publicly funded research activity in Norway. Against this background, it is essential that we learn more about how the instrument works in practice. The systematic evaluations conducted by the research institute Møreforskning since the mid 1990's has tended to focus more on the results and the measurable economic growth resulting from these kinds of projects (Hervik et al., 2009).

In 1997 an evaluation of the user driven research administered by the RCN was conducted. The report included an analysis of a survey among 99 research institutes which

had been involved in user-driven research projects in the first five years after its inception. The aim of the survey was to investigate relationship between the research institutes and the industry and looked at the parties' roles in initiation, completion and implementation of the project results (Hervik and Waagø, 1997). However, I am not familiar with any qualitative or recent studies performed on this subject. In constructing policies that are aimed at supporting user-driven research, it is important to investigate and try to understand the relationship between the research institutions and business and industry. If you wish to further develop something, it is definitely paramount that you understand it how it works.

Since much of the rationale behind the research policy promoting this form of user-driven research is based on the fact that it is expected to yield value creation and economic growth, it is important to explore how these alliances are formed, reproduced and maintained in detail. This study will be a contribution to the literature focusing on the circumstances of innovation and how innovation occurs. Using a qualitative approach, the study will help to open the black box of user-driven research and aim to uncover some of the underlying processes of alliances and relations embedded therein.

## 1.4 Structure of the thesis

In this thesis my goal is to explore the interaction between organisations and relations that exists between the co-operating partners, and from this try to isolate some of the factors that come into play when a partnership is formed under the framework of a BIP. This entails examining both the motivation and the circumstances surrounding the establishment of the relation and the relation itself. Who chooses to co-operate with whom, why is this the case and what characterizes their relation?

In chapter two I will present the central actors in this respect and also explain the distinguishing features of the instrument, BIP, within which the alliances are formed. Chapter three will present the theoretical concepts and analytical framework I consider relevant in this investigation, and chapter four will present the methodological approach I have chosen to collect data suitable to answer my research question. In chapter five I present the main findings of my empirical investigations and analyse this in light of the theoretical concepts outlined in chapter three. Finally, in the last chapter, I summarize the main discoveries and try to draw some conclusions on the results and possible policy implications.

## 2. Setting the stage – instrument and actors

My point of departure is exploring the social relations and interaction that takes place in connection with a specific instrument utilised in Norwegian innovation policy, i.e. User-driven Innovation Project. In this chapter I will describe the formal framework of the User-driven Innovation Project and the formal guidelines and common practices adopted by the RCN in implementing this instrument. I will also give a general description of the actors I consider relevant to my case.

### 2.1 The instrument - The User-driven Innovation Project (BIP)

The RCN utilises four main types of funding schemes: independent research, infrastructural and institutional measures, networking measures and research programmes. Approximately half of the funds are distributed through a research programme, i.e. a co-ordinated and strategic research initiative in a designated field or thematic area. RCN uses approximately 20 different standardised types of application, one of which is the User-driven innovation Project or BIP. Each application type has been defined with respect to objective, use and assessment criteria. The BIP is an application type or project type mostly employed by the research programmes. The criteria specified for the application type, in combination with each individual call for proposal define the requirements of each project proposal ([www.forskningsradet.no](http://www.forskningsradet.no), 2009).

As described briefly in the introduction, the BIP is a central part of the RCN's instruments aimed at business and industry. The expressed goal of these projects is to stimulate R&D activity in business and industry to promote innovation and value creation.

In a BIP, the project owner signing the contract with the RCN must be a Norwegian firm, registered in the national Register of Business and Enterprises. The maximum funding from RCN is limited to 50 % of the total project costs, but the firm or the consortium is usually expected to contribute more than 50 % of the of the project funding. ([www.forskningsradet.no](http://www.forskningsradet.no), 2009). Applications of this type are generally evaluated by both external experts and the programme administration according to the assessment criteria



stated in the basic requirements of the application type and the individual calls for proposals. The final decision to grant funding to a project is normally made by a programme board.

There is nothing in the formal basic criteria of the BIP application type compelling firms to enter into alliances with other firms or research institutions in Norway. The formal requirements of the BIP application type include level of innovation, research content, commercial benefits, relevance or benefits to society, international co-operation and general project quality. However, from 2009 the firms who *do* choose to form a partnership are required to set up a formal consortium agreement between the parties. This agreement or contract must be signed and sent to the RCN before the firm can sign the contract with the RCN. The content of the consortium agreement is in many respects left to the parties, but the RCN operates with a suggested model contract for such an agreement. The contract is a point of departure as a tool for clarifying intellectual property rights (IPR) and obligations. Earlier, it was up to the parties themselves to decide how to formalize an alliance in connection with a BIP. Many chose to sign consortium agreements, but this was no requirement.

As described above, the individual calls for project proposals issued by research programmes may specify additional criteria. For instance a call may state that that applicants who choose to engage in collaborations including other parts of the value chain or research institutions may be preferred. An investigation of the most recent calls for proposals and programme plans from a number of programmes using this application type also shows that it is common practice include information alerting the applicants to the fact applications from alliances/consortia will be given priority over other applications. In the most recent call for proposals from the program RENERGI states for instance (my translation): “RENERGI will give priority to applications from networks and groups (producers, suppliers, investors and R&D institutions)”. In the program plan for PETROMAKS I find the following description of BIPs (my translation): “Firms may apply for grants on behalf of a consortium. (...). Grants to one single firm may be approved in exceptional cases only”. And finally, in the program BIA’s description of a typical BIP (my translation): “The projects are genuine collaborations normally carried out by a consortium (...). The consortium includes the best and most relevant national or international R&D institutions” ([www.forskningsradet.no](http://www.forskningsradet.no), see references for detailed list of web pages).

In my initial investigations working on this thesis, I received a list from the RCN including all User-driven Innovation Projects which had a budget in 2008. A closer investigation of the projects on the list showed that the majority of the firms, though not all

of them, had registered consortium partners (List obtained from the RCN, 08.05.2009). This indicates that the way the BIP instrument is applied by the programmes and the administration in the RCN promotes the formation of alliances between firms and/or firms and research institutions in practice. The instruments therefore appear to function as an arena where alliances are formed or reproduced and maintained.

## 2.2 Two sides of the collaboration – industry and academia

The Norwegian research system's performing level can be divided into three parts: the business and industry, the independent institute sector and higher education, i.e. Universities and colleges. This means that when firms decide to team up with an academic partner in Norway, this partner will be from the institute sector or the higher education sector. The higher education sector consists of 7 universities, six specialised universities and 25 university colleges. Approximately one fourth of the total R&D activity in Norway is carried out within this sector ([www.forskningsradet.no](http://www.forskningsradet.no)).

In contrast to Sweden for instance, Norway has developed a large sector of research institutes which are an integral part of the research system. From the mid 1980's the research institutes were "cut loose" from the ownership of the NTNF, and reorganised into independent institutes. However, today the RCN still maintains a strategic responsibility for the sector. A total of 51 research institutes constitute a group governed by a set of regulations for state funding. These research institutes receive basic lump sum funding, and the rest of the income has to be generated by R&D services to national and international customers, private as well as public (Ministry of Education and Research, 2009). The institute sector is characterized by its diversity. Some institutes are highly mission oriented while others are mainly user-oriented, serving different industrial actors (Nerdrum and Gulbrandsen, 2009, Ministry of Education and Research, 2005).

The institute sector is clearly separate from the higher education sector, but the heading implies that I include them in the term "academia". Whether or not a research institute should be defined as an academic institution is not immediately self evident. Many of the research institutes operate in manners clearly resembling a private enterprise. However, for the purpose of this thesis, the research institutes and the higher education sector alike represent the potential academic partners available to a firm looking for an alliance partner in a BIP.

## 2.3 Aiding and abetting: The Research Council

The Research Council is the main distributor of public funds for research and development in Norway and has three prominent roles: it acts as advisory body and provides crucial policy input to the Government, it is responsible for translating national research goals into action through different funding schemes and serve as meeting ground for individuals and organisations affiliated with research ([www.forskningsradet.no](http://www.forskningsradet.no), 2009). Although the RCN is not the protagonist of my thesis, its role is important in colouring in the background of the picture i.e. providing the funding for the BIPs.

The role of the RCN is manifold in the sense that the acting out of these roles influences several aspects of the social and formal context of which a partnership is embedded. Being the Government's "expert body" and advisor on research and innovation policy, it is also fair to assume that the RCN influence the authorities' decisions on where to allocate research funds. Then the RCN are responsible for distributing these funds, which it is fair to assume may enable projects and alliances which might otherwise not have occurred. The RCN is also responsible for translating national policy and strategy into action, thus formulating goals of programmes and specific calls, determining areas of priority as well as the formal guidelines of the projects ([www.forskningsradet.no](http://www.forskningsradet.no), 2009). In addition to providing the formal guidelines, there is also the matter of how the guidelines are put into practice, and which projects are given priority in the competition for research funds.

As described above, there is nothing in the formal BIP guidelines indicating that partnering up with another organisation is necessary in order to receive a project grant. However, the specifications of the individual calls of the programmes utilising BIPs indicate that working with a consortium might prove beneficial. Thus these elements are potentially influential at some point in establishing a partnership between a firm and a research institution. Though hovering somewhat on the perimeter of the collaboration that is the central object of investigation, the RCN is essential to the circumstances and events surrounding the relationship of the project partners, hence potentially influencing their interaction and alliance formation.

### 3. Theoretical foundations

This chapter will form the basis of understanding and analysing the empirical evidence gathered in the investigation. Seeing as how innovation, research and development are central concepts in understanding of the social circumstance in which interaction occurs and the relation is formed, I will start with a closer look at these concepts. The actors co-operate, communicate and form bonds in order to develop new technology as the basis for new products or processes. With this in mind, I will go on to narrow the scope, leading the way to the core of the matter: the alliances that arise out of these circumstances. The main part of this chapter will contextualize and outline the theoretical concepts of that I rely on in the discussion of my empirical material.

#### 3.1 The concept of innovation

My starting point in this thesis is to investigate the interaction between actors in projects stimulating innovation in business and industry, thus enhancing value creation and economic growth; The User-driven Innovation Project. It is therefore necessary to try to understand what lies in the somewhat elusive term “innovation”.

One of the most central and most cited figures when it comes to defining and understanding innovation is the economist and social scientist Joseph Schumpeter. He was one of the few economists to recognize the importance of innovation in economic development very early in the 20th century, and he also addressed the role of entrepreneurs and of organized R&D in his publications. Joseph Schumpeter defined innovation as a new combination of existing resources (Fagerberg, 2005). A more recent definition is provided by Schilling, who defines innovation as “the practical implementation of an idea into a new device or process” (Schilling, 2008). Godø has two short definitions for innovation: First, an innovation may either be something that yields a perceived benefit, economic or other, and second, it may be something that is perceived as “new” (Godø, 2007). Fagerberg, Schilling and Godø alike underline the difference between invention and innovation: an invention is the first occurrence of an idea for a new product or process, whereas an innovation is the first attempt to carry it out into practice. However, the two might be closely connected and

difficult to separate at times. An invention will not automatically turn into an innovation, just as a number of innovations are not built directly on one specific invention.

In discussing innovation, and instruments promoting innovation, it is essential to highlight not only what lies in the term innovation, but why this is such an important concept in the way we choose to organise our society. Innovation and technological development is perceived to be central to continuous economic growth (Oslo Manual, 2002).

However, the exact relationship between knowledge production, innovation and economic growth is not settled and the highly contingent nature of innovation processes makes it difficult to draw any general conclusions (Pavitt, 2005)

Two dominating, but competing, paradigms for explaining this relationship emerged during the 1980's and the 1990's; the so-called neoclassical approach and the neo-Schumpeterian or evolutionary approach. The neoclassical approach emphasizes strong analytical consistency and quantitative modelling, thus downplaying the importance of the actual innovation processes and the heterogeneous actors at work in real life. The evolutionary approach, on the other hand, is more focused on the innovation processes itself and the heterogeneity of the actors. However, both of these approaches agree that innovation and technological development is important for economic growth and that Governments and policy makers may have a positive role to play in this respect (Verspagen, 2005).

My study is focused on the interaction taking place in innovation projects and inserts itself into a vast body of literature focusing on the circumstances and dynamics surrounding the innovation process and the occurrence of innovation. The fact that innovation is a systemic phenomenon and a result of interaction is a central issue within the National System of Innovation's (NIS) tradition. The term innovation system was first used by Christopher Freeman in 1987, but another important contributor in this tradition has been Bengt-Åke Lundvall. In his definition, a system of innovation encompasses organisations involved in innovative activities, i.e. universities, private and public research institutes, other research organisations and industry. Essential to Lundvall's approach is learning and knowledge as central elements of the economy. He also highlights the production of knowledge, the diffusion of knowledge and the exploitation of knowledge as the central functions of an innovation system (Lundvall 1985, 1992 in Spilling and Rosenberg, 2007). The increasing significance of knowledge to innovation and the economy makes it natural to examine more closely the relations between the actors and how they interact in developing and trading knowledge in practice (Spilling and Rosenberg, 2007).

Today's perception of what innovation is and the importance of innovation in our society is also reflected in the way we measure and collect data on innovation. In Norway, the NIFU STEP (Norwegian institute for studies in innovation, research and education) co-publish a report with Statistics Norway and the Research Council of Norway summarizing facts and figures of what is termed "the Norwegian research and innovation system". The report has been published every other year since 1997, and provides a unique insight into the size of human and economic resources applied in the quest for innovation, and the results the effort has yielded. The report describes national R&D efforts in universities and research institutes as well as business and industry and also innovation activities and efforts. Following OECDs definition, *the firm* is perceived as the central entity in innovation activity (Indikatorrapporten, 2007).

### 3.1.1 The role of R&D in innovation

The interaction and alliance formation in BIPs centre around research and development and the role it plays in innovation. The role of R&D in innovation has been a matter of dispute. The OECD has developed definitions of research and development, stated in the Frascati manual:

The term R&D covers three activities: basic research, applied research and experimental development; **Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. **Applied research** is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective. **Experimental development** is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed (Frascati manual, OECD, 2002).

The notion that innovation rests solely on a "linear process" starting with basic research and followed by development in several stages into a new product or process, has been

widely criticized for being an incomplete and even distorted picture of the innovation process (Fagerberg, 2005). One of the most influential papers in this respect was contributed by Kline and Rosenberg who developed “the chain-link model”, showing that rather than being a linear process, innovation involves many interactions and feedback loops; it is a constant learning process that involves multiple inputs and innovation does not depend on R&D as an initiating factor, but rather as a step on the way to solving a problem. Research is seen as applicable at any stage in the innovation process and not necessarily as a preceding factor (Kline and Rosenberg, 1986, Smith, 2005). Several decades of studying the circumstances of innovation activity and trying to identify how innovations occur have shown that what is usually termed research and development is only one of many factors contributing to innovation.

However, research and development still holds a strong position in Norway’s strategy to enhance innovation and similar to a number of other European countries, our Government has on several occasions stressed that they subscribe to the Lisbon Agenda adopted by the European Union in 2000, which states that in order to increase innovation and economic growth, national expenditure on R&D of at least 3 % of GDP should be reached within 2010 (Clausen, 2009, Ministry of Education and Research, 2009).

The fact that the firms receiving grants under the BIP instrument choose to team up with research institutions resonates well with Kline and Rosenberg’s notion, that research may be an important element in extending a firm’s knowledge base *during* an innovation process. Innovation, research and development are inextricably bound to one another through complex operations. However, the difference is also underlined by the fact that two separate Reports to the Storting on these issues have been published in Norway in 2008-2009: One focusing on research and development (Ministry of Education and Research, 2009, and one on innovation (Ministry of Trade and Industry, 2008).

## 3.2 Collaborations, alliances and networks

Studies of innovation over the last three decades have demonstrated that innovation in a firm does not occur in isolation, but as a result of interaction with the firm’s environment.

Fagerberg calls innovation systematic in nature in that it results from continuing interactions between different actors and organizations (Fagerberg, 2005). The focus of my thesis is the interaction between the parties and the relation embedded in the BIPs, aimed at increasing

innovation in firms. In most of these projects, a firm chooses to form an alliance with a research partner, i.e. a university or a research institute, and/or other companies, thereby involving actors belonging to both the public and the private sphere. OECD Science, Technology and Industry Scoreboard 2007 states the following on collaboration:

”Collaboration is an important part of the innovation activities of many firms. It involves *active participation in joint innovation projects with other organisations* (Oslo Manual, 2005), but excludes pure contracting out of work. Collaboration can involve the joint development of new products, processes or other innovations with customers and suppliers, as well as horizontal work with other enterprises or public research bodies.”

(<http://masetto.sourceoecd.org/vl=1531531/cl=41/nw=1/rpsv/sti2007/c-5.htm>, 2009)

### 3.2.1 The name of the game

There are several ways of approaching the investigation of this interaction. This is evident in the extensive body of literature devoted to the study of interaction or relations between organisations and individuals, and is also underlined in the many possible names by which such relations are identified by in the literature. A formal or informal, potential or existing bond between two or more separate entities can be placed in a large number of different boxes, depending on which glasses you observe the phenomenon through: strategic alliances, science-industry collaborations, social networks, interorganisational collaborations, R&D alliances, decentralised R&D structure, inter-firm collaborations, product development alliances or strategic technology partnering are some examples. The multitude of names and dimensions surrounding collaborations makes it quite difficult to gain an overview of previous research in the field.

As Powell and Grodal point out in their article “Network of Innovators” (2005), the advantages of being a member of a heterogeneous group of contacts are well established within both network analysis and social theory. The last decades have seen an unprecedented growth in corporate partnering and reliance on various forms of collaboration, and this growth has attracted attention from scholars within various disciplines such as economics, sociology, social psychology, organisational behaviour and organisational management (Powell, Koput and Smith-Deurr, 1996, Gulati, 2007).

In a paper from 2000 Hagedoorn, Linka and Vonortas examine the academic and professional literature on what they call *research partnerships*, broadly defined as “an



innovation-based relationship that involves, at least partly, a significant effort in research and development” (Hagedoorn et.al, 2000, p.567). The partners in such research partnerships may come from either the public sector or the private sector. The research examined in their paper comes from authors in a number of different fields such as economy, strategic management, public administration, philosophy of science, science and technology policy etc. The authors also point out the vast amounts of existing literature on this subject, and they distinguish between three categories of literature concerning research partnerships: transaction costs, strategic management and industrial organisation. The strategic management tradition includes approaches like competitive force, strategic network, resource-based view of the firm, dynamic capabilities and strategic options to new technology. According to their paper, the literature of research partnerships has commonly focused on two things: why research partnerships are formed, and the results of these research partnerships (Hagedoorn et al., 2000).

My study is a closer examination of the *interaction* between the partners in a BIP, commonly including partners from both the private and the public sphere. Instead of simply asking for what reasons or with what motivation these partnerships are formed, I venture to explore characteristics of the interaction from a broader perspective. This entails not only exploring the motives of the initial contact, but the interaction taking place and the nature of the relation in the process of establishing a project. In doing this, I will employ perspectives presented by Ranjay Gulati and Mark Granovetter respectively. Ranjay Gulati’s concepts, as presented below is somewhat connected to the resources-based view of the firm, as it entails expanding this perspective to also include resources outside the firm’s borders, whereas Granovetter’s perspectives belong in the sphere of economic sociology and social network theory.

### **3.2.2 Exploring the interaction - network resources and relational capital**

In order to increase the understanding of how innovation occurs, it is important to try to determine the characteristics of the interaction that arise from projects aimed at innovation. Under the BIP framework, a number of companies choose to enter into formal alliances with an academic partner. Both the academic institution and the business partner in such a project are embedded in different kinds of networks. It is in this landscape that a relation is created

between organisations, eventually formalised in a consortium agreement. Why do they choose to organise themselves in this way?

The relational capital that emanates from the networks in which firms, as well as universities and research institutes find themselves embedded, have been thoroughly examined by Ranjay Gulati. Gulati is a leading theorist and researcher in the field of alliances and networks and his work during the last 15 years is brought together in his recent book, “Managing Network Resources” (2007). Here, Ranjay Gulati develops a conceptual framework that allows for the analysis of an organisation’s resources originating in existing and potential networks and co-operative ties and how these relations influence choices, behaviour and economic action. His framework provides a useful starting point for eliciting how the relation is formed, and where, why and under which circumstances it comes into existence.

Gulati’s examples and studies mainly focus on inter-firm strategic alliances, exemplified in numerous empirical studies throughout the book. However, the concepts he develops are relevant to a broader class of inter-organizational ties. Gulati (as Granovetter and others) have argued that most perspectives have a tendency to underestimate or overlook the social aspects of the dynamics between and the behaviour of economic actors (Gulati, 2007, Granovetter 1985, Coleman 1988). He aims at providing a socialized account of the behaviour of organisations, without “oversocializing” the subject. The incorporation of social network factors into the study of a firm’s strategic behaviour will render a more detailed and accurate picture of which factors influence the establishment of ties and links (Gulati, 2007).

### **3.2.3 The concept of network resources**

What exactly does Gulati’s concept incorporate? “Network resources” is a multifaceted concept encompassing the substantial resources based on the multitude of ties that exist in and between firms or organisations. The resources emerging from potential and existing networks are dynamic and fluctuating, and will also in turn affect the network in which it originated, thus constantly influencing its development. The formation of new alliances, introducing new players in the existing network, may affect the structure of the existing network and influence the future formation of alliances. Network resources can serve as conduits for valuable information and material resources, reducing search costs for new ties, increasing visibility for potential partners and building reputation and trustworthiness.

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Gulati's concept of network resources "(...) highlights the importance of unique historical conditions and suggests a path-dependent process by which firms accumulate network resources that are sticky and can become bases for sustainable competitive advantage." (Gulati, 2007, p. 13). As mentioned above, one of the research traditions in the study of partnerships and innovation is founded on a "resource based view" of the firm where a firm's competitiveness and success rests on its internal resources; the physical and human resources that are distinguishing features of a firm and difficult to imitate (Lazonick, 2005, Smith, 2005).

By introducing his concept, Gulati expands the resource based perspective to a perspective where network resources include external resources which result from network membership and location. He draws the focus away from the resources of each separate entity and highlights the resources originating in the *relation* between these entities (Gulati, 2007).

Gulati also introduces a broader approach to network resources, an approach which incorporates ties to customers, suppliers and subunits in addition to alliances. An organisation's network resources are a function of the number of ties as well as the quality of ties. He considers how a successful firm can develop the ties that exist and in turn provide access to even richer network resources. His findings suggest that successful enterprises consider the *combination* of the various relationships and ties they have, in optimizing their performance. In this further developed model to explain the multifaceted nature of network resources, he divides network resources into four dimensions: Suppliers, Customers, Organizational subunits and Alliances.

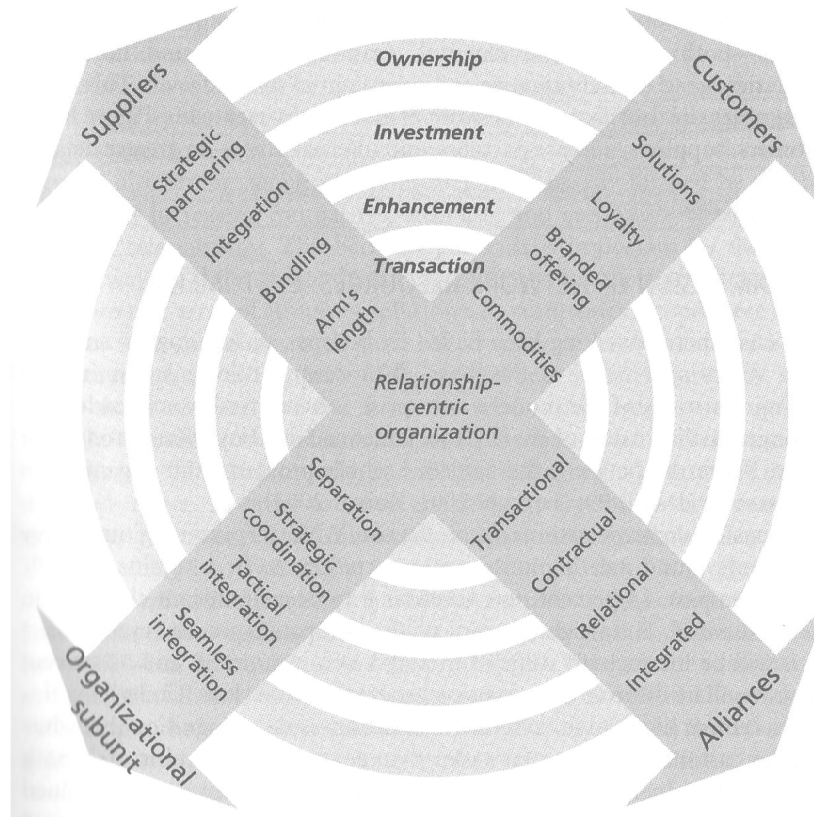


Figure 1. The four dimensions of network resources. Gulati 2007, p 181.

In combination, these dimensions and the quality of the ties embedded therein, defines the network resources available to an organisation.

In each of the four facets of network resources available to an organisation, the relation between the parties develops in steps, similar to the rungs of a ladder. The alliance relationship ladder starts at “transactional” on the lowest rung, then develops through “contractual” and “relational”, and then finally to “integrated”. The other three dimensions of network resources are similarly described in terms of steps up a ladder.

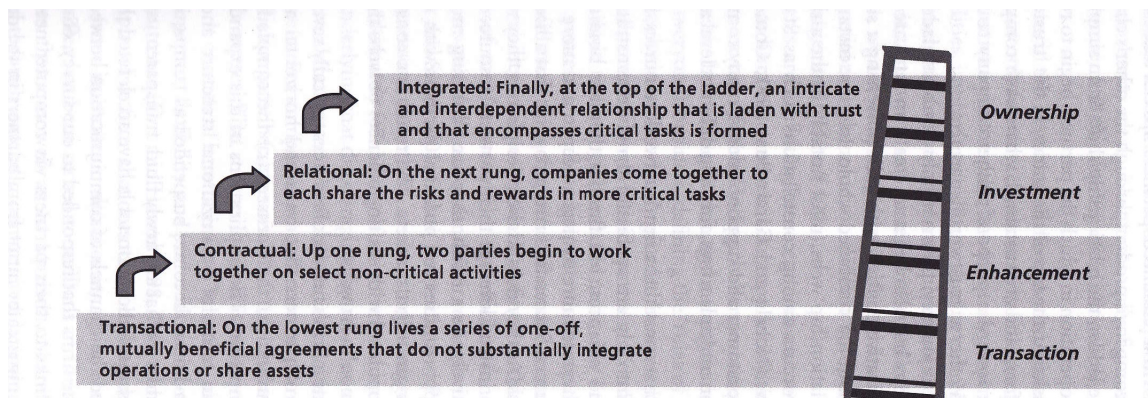


Figure 2: The alliance relationship ladder, Gulati 2007, p.197

A central element characterizing the interaction between parties in the process of establishing a project, is identifying their reasons for choosing that particular partner over another. This also requires being aware of the *potential* partners of a firm or an organisation, how to categorize them and decide what kind of step in the relationship ladder they are on, or how high up you would like them to be.

### 3.2.4 Relational embeddedness and structural embeddedness

Another element central to the interaction between organisations is how and where the relations originate. These components of network resources take into consideration not only the immediate motivations for entering into alliances, such as acquiring access to knowledge or equipment, but also how and where the information about these features of organisations originates. Organisations engaging in alliances will always be faced with moral hazards and risk costs of opportunistic behaviour by a partner. Organisations acting rationally will seek to find partners who meet their needs, while trying to minimize the risks and uncertainties of an alliance. The formation of a new alliance is characterized by uncertainty stemming from at least two different sources: a) difficulties with obtaining information on needs and competencies for potential partners and b) difficulties information on the reliability of potential partners (Gulati, 2007). In his 1985 article on economic action and social structure, Mark Granovetter points to the embeddedness argument, which stresses “(...) the role of concrete personal relations and structures (or “networks”) of such relations in generating trust and discouraging malfeasance” (Granovetter, 1985, p. 490).

Gulati relies heavily on the concept of social embeddedness in developing his arguments for explaining interorganisational behaviour. Drawing on Granovetter’s work, he

shows that network resources can originate in three different forms of embeddedness: *relational embeddedness*, i.e. direct and proximate ties, *structural embeddedness* i.e. more indirect and distant ties and *positional embeddedness* i.e. the organisations location in an overall network (Gulati, 2007). Gulati argues that two components of network resources are particularly pertinent: the relational component and the structural component of network resources. The information channelled through the relational and structural components of network resource may provide crucial information on the availability, capability and reliability of other organisations.

The relational component of network resources is made up of direct and proximate links and will include partners with which an organisations has prior dealings. This kind of relational component is particularly important because it provides each organisation with first hand information about other organisations. The cost of such information is low, you are more likely to trust the information you have acquired yourself through direct links and there are economic incentives to act trustworthy in a relation with regard to future alliances. Originally economically motivated relations become permeated with social content encouraging future trustworthiness (Granovetter, 1985, Gulati, 2007).

While the role of direct ties in the formation of new alliances may appear evident, indirect and more distant ties may also form an important component of network resources as conduits for essential information. Structural embeddedness highlights the social network in which an organisation is located, and focuses on whether indirect ties beyond the first level also generate network resources which may influence the formation of alliances. As with relational components of network resources, the information may reduce search cost and moral hazards. The simplest form of an indirect tie is the sharing of a third partner. (Gulati, 2007, Gulati,1999). The relational as well as structural components of network resources are assumed to be influential in alliance formation.

Gulati by and large focuses on the positive effects of network resources, i.e. the “resources” represented by the array of heterogeneous ties surrounding the organisation. He does occasionally refer to possible negative effects: “network resources may constrain a firm’s set of choices for alliances by limiting the circle of potential partners about whom it has information, and providing no information about non-participants” (Gulati, 2007). He does, however, not delve deeply into the potential effects that may result from repeated alliances within the same networks.

### 3.2.5 Exploring the relation - strong and weak ties.

In 1973 Mark Granovetter published his seminal article “The Strength of Weak Ties”. In this article he explores how individuals’ networks overlap and vary with the strength of the ties, with a subsequent impact on the diffusion of influence and information. His article is also an attempt to link micro-level interactions to macro-level patterns and show how each individuals experience is bound to wider aspects of social structure, a perspective he felt to be lacking in contemporary sociological theory (Granovetter, 1973).

Granovetter separates the nature of the tie into three different categories: strong, weak or absent. For the purpose of his argument he offers the following dimensions to be considered in a “strong tie”: The amount of time, the emotional intensity, the intimacy and the reciprocal services that characterizes the tie. Granovetter underlines the strategic importance of weak ties as conduits for novel or non-redundant information. Granovetter’s concepts here presented, provides an interesting backdrop in exploring the circumstances of interaction, the actors themselves and the characteristics of the relation in user driven innovation projects.

Granovetter starts off his elaboration by suggesting that the stronger ties between two entities, the greater the probability that they will have overlapping circle of contacts. If A has a strong relationship with B, and also with C, it is likely that B and C will at some point come into contact with one another and also share the same information. He further refers to the concept of the “bridge” as a line in a network which provides the *only* path between two points (Harary, Norman and Cartwright, 1965 p.198 in Granovetter, 1973). From his argument, we can assume that bridges have important roles in the study of diffusion. His argument further states that a strong tie for instance between A and B could be a bridge only in the unlikely event that no other strong ties are present on either side, creating overlapping contacts. Hence he concludes that all ties functioning as bridges are weak ties. Though underlining that a specific tie serving as the *only* path between two points may not occur often in practice, a weak tie serves an important purpose by serving as a local bridge, i.e. the shortest and most efficient path between two points. It is possible to envisage the removal of ties in a network. Granovetter’s contention is that when it comes to transmission possibilities, the removal of an average weak tie will have greater consequences than the removal of a strong tie. Drawing on a number of different diffusion studies in the

construction of his argument, he also suggests that more people can be reached through the weak ties, than the presumed strongest ties.

What are the consequences of these suggestions? Typically, weak ties will be the path to an indirect contact, and through this path, socially distant information, influences and ideas will pass through. The fewer weak ties, the more secluded the individual will be in terms of acquiring knowledge from outside the closest network. On a more macro-scope note, he points to the role of weak ties in creating social cohesion: A person changing jobs, moving from one network to another, will at the same time form a link between the two networks in which he is embedded. All these “weak” links established between more closely knit networks, creates a social interconnectedness which may prove important in serving as sources of information and resources.

According to Granovetter then, the information flowing through weak ties is more likely to represent novelty. Following this line of thought, information flowing through weak ties could offer increased opportunities for innovation. However, this is a matter of debate. Weak ties may provide access to novel ideas, but strong ties may provide information considered to be more trustworthy, correct and useful, thus limiting the access cost and risks (Powell and Grodal, 2005, Gulati, 2007)

### 3.3 Analytical framework

The relation embedded in the user-driven innovation projects will be explored in light of the ideas and concepts developed by Gulati and Granovetter, outlined above.

Central to my analysis is Gulati’s definition of network resources as “sources of valuable information residing outside a firm’s boundaries that may influence strategic behaviour by altering the opportunity set available” (Gulati, 2007). First of all, the environment surrounding the projects will be explored in light of Gulati’s four dimensions and the relationship ladder. Gulati visualises the potential network resources and quality of ties through these concepts, and highlight the success of firms that are able to structure their network resources emanating from the ties and the social networks in which they are embedded.

The concepts relational and structural embeddedness are also a part of the network resources but allows for a closer examination of the origin of the information valuable to organisations in entering into partnerships. Whereas the first part can enrich the



understanding of the social circumstances in which the organisations examined are embedded, the concepts of relational and structural embeddedness allow for a closer examination of where the valuable information emanating from network resources *originates* in connection with the cases to be explored in the thesis.

Granovetter's concept of strong and weak ties provides a complementary framework for investigating the relations in the projects. Both Gulati's steps up the relationship ladder and his concepts of relational and structural embeddedness bear in them some aspect of strong or weak ties. However, a direct and proximate tie originating in relational embeddedness is not immediately classifiable as strong or weak. Also, Gulati suggests that in optimizing your network resources it is a goal to climb up the steps of the relationship ladder. This underlines the importance of strengthening the bonds between the actors. In this picture, Granovetter's analysis of strong and weak ties provides a slightly different angle. He highlights the fact that strong ties does not necessarily mean more information or more useful information, and points to the potential strategic importance of the weak ties. He also highlights the aspects of *novelty*, which is central to innovation, and the possible limitations of strong ties surrounding an individual or an organisation. True, Granovetter's concept of strong and weak ties may be difficult to distinguish or separate entirely from the concepts already introduced in Gulati's framework, and there is indeed some overlap, but in the cases explored in this thesis it is fruitful to take his perspectives into consideration.

## 4. Method and data material

This study has been based on a qualitative approach with an exploratory case-study design. In this chapter I will explain what underlies the choice of research design and discuss why I consider this method best suited to answer my research question. Then I will look at how the research question has been operationalised, the units of analysis and the choice of specific cases. This is followed by a closer look at how the data has been collected and processed for further analysis. The chapter is rounded off with some critical reflections on method and data collection, as well as the challenges I have been faced with during the empirical investigation. It must also be noted that though the RCN provided me with the original idea for the thesis, it has not been written on assignment for the RCN. The research question, the design and content have been developed independently, without restrictions or guidelines from others.

### 4.1 Research design

How you decide to design a research project is crucial in securing empirical data that provide answers to your research question. As established in my research question, my objective is to examine how two different organisations interact and relate to each other in the process of forming a partnership within the framework of a BIP. Untangling the social circumstances of the research question's main focus indicates an in depth-study. According to Yin, a case study is "an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p.18). A case study approach therefore seems well suited for the purpose of answering my research question.

There are several possible ways of designing a case study, ranging from single case designs with a single unit of analysis to multiple case designs with several embedded units of analysis in each case. Case studies are often classified as either explanatory, descriptive or exploratory, depending on the research question posed and the circumstances of the study. However, the lines between these categories are somewhat blurred (Yin, 2009). My study is a multiple case study, and with both descriptive and exploratory features. The objective is to describe a certain phenomenon and its context, but also to explore an instrument and

processes which have previously been “black-boxed”. The research question indicates study in which the goal is to open this black box, with an underlying goal to provide increased knowledge about a particular instrument about which little is known of what happens in practice. The exploratory aspect is also underlined by the choice of to study multiple cases. The aim of investigating several cases is to uncover as many facets as possible of the interaction and the relation between the alliance partners in such projects. The actors who are engaged in the BIP projects may vary considerably from project to project. Firstly, there are no criteria in the instrument itself specifying the sector, size or location of the firms which are granted funds in these projects. Secondly, the academic partners are from one of the universities or the institute sector. The institute sector is a “very heterogeneous group of units with different tasks and target groups, different backgrounds and financial basis, and different organisational forms and forms of affiliation” (Ministry of Education and Research, 2005, p.169). The aim is to identify central factors or elements that come into play in the practical implementation of the BIP instrument, and the theoretical aspects developed by Gulati and Granovetter will help me understand and interpret the results of my empirical investigations.

My aim was a “thick description” of a contemporary phenomenon, and to study the social circumstances of interaction and relation, to look at it holistically and comprehensively, and study it in its context. A possible critique towards the design could be that too many cases were investigated, and that an even closer description of fewer cases could have been a better solution. However, in all the cases which form the basis for analysis, both parties were interviewed, with interviews lasting 1 hour on average. This should in my view provide sufficient information to form an opinion on how the relation was formed and how the interaction played out.

## 4.2 Answering the research question – operationalisation

Operationalising the research question entails defining what type of data will be best suited to answer this question and how and where to obtain this data, including defining the relevant unit of analysis and sources of information. Empirical research basically means collecting data from the real world, and it is paramount that the research question contributes clear indications as to where to look for these data.

There are two main types of data, quantitative and qualitative, or basically whether the data are materialised in numbers or words (Punch, 2005). In keeping with Gulati and Granovetter's socialized account of the behaviour and links between organisations and the ambition to explore the social context and content of the relation between them, a qualitative approach was adopted. The primary source of data was in-depth interviews with key actors, but also documents retrieved from the project archives in RCN and their own official documents published on their web-sites.

My research question contains one main element to be explored: the *interaction* between the co-operating parties in a BIP. Grasping the interaction and the factors characterizing it might appear an elusive task. In order to collect data on the characteristics of the interaction and relation between the actors, the *interaction* were operationalised into the following dimensions: the *social contexts preceding* the alliance, *forming and stabilising* the alliance, the *circumstances of the origin* of the project and the alliance, and the *nature of the relation* in the alliance.

My starting point is one particular project that has received funding from RCN. Methodically I ventured to limit the period of study from the inception of the collaboration on their current project and up until the contract with the Research Council had been signed for this project. However, most of the projects being well underway at the time of the interview and the questions being open ended, the interviews would also frequently touch upon the relation between the partners during the project period or the completion of previous projects.

Gulati's four facets of network resources, the steps up the relational ladder and relational and structural embeddedness form the basis for understanding the empirical findings in all these four categories. In addition to this, Granovetter's work on strong and weak ties will offer a complementary interpretational framework in that he brings in the potential importance of weak ties and also the potential limitations of strong ties.

Based on the four categories an interview guide was developed. The interviews were semi-structured interviews with open ended questions.

#### **4.2.1 Unit of analysis**

My research question indicates both the relevant unit of analysis and delineates the relevant period of investigation. The period to be investigated is the process leading up to the formal establishment of the project, i.e. when the firm signs the contract with the RCN, and my

main unit of analysis would appear to be the project in which the relation exists and interactions takes place. However, as my research question focus on the interaction and relation existing somewhere in the sphere between the parties of the project, the real unit of analysis can be said to *be embedded in* the projects, as exemplified in the illustrating below, showing a project that consist of one firm and one research partner. Nevertheless, the projects are my gateway into this relation.

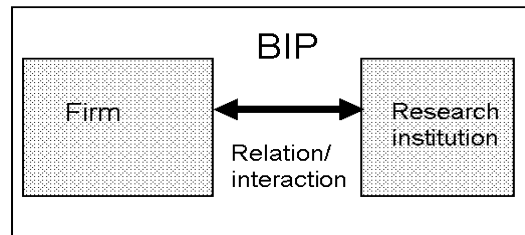


Fig 3. The unit of analysis embedded in the project/case

Thus, in order to grasp the characteristics of the relation and interaction that exists *between* the different actors it is necessary to interview all parties in a project.

#### 4.2.2 The choice of specific cases

In collecting the data it was extremely important that the interviewees felt that they could speak freely and unrestrained of relationships to other organisations and associates. In the interest of securing the quality of the data, the interviewees were made aware that neither their name, nor the name of the organisation or specific project would be disclosed in the thesis. Thus the anonymity of the participants will be maintained throughout the thesis.

This is of course a potential weakness when it comes to reliability of the data. However, in this context it was crucial that the interviewees felt that they could elaborate on personal relations and organisational relations and how they perceive their own position, without being worried about what effect this might have upon publishing this thesis. I am positive that this ensured a more open and honest conversation with the interviewees, who on several occasions contacted me to make sure that their anonymity would be maintained throughout the thesis.

The selection of specific cases or projects for further investigation was done in several stages. Some fundamental criteria would have to be fulfilled. Firstly, the projects would have to be BIPs, i.e. officially classified in this category in the RCN database.

Secondly, as my focus was on exploring the interaction in the period leading up to the alliance formation, the projects would have to be fairly recent, in order for the interviewees to remember as much of the process leading up to the establishment of the alliance as possible. With this as a starting point I received a list from the RCN over all BIPs which had a budget in 2008.

As mentioned above, the research question would require me to interview all parties in the consortium of a project in order to obtain data sufficient to answer the question. Having already decided on a multiple case design, and with limited time and resources available, it was crucial to choose projects with few partners. Because my research question focuses on the interaction between firms and academic institutions the list was further narrowed down to consortia consisting of two partners, one research institution and one firm. For practical purposes only projects with Norwegian partners were included. This left me with a short-list of potential projects to contact.

There is some aspect of “purposive sampling” in the final selection of projects, that is to say that the cases are not selected completely at random from this short-list. Part of the purpose for choosing a multiple case design was revealing as many aspects of the relation and interaction between a firm and a research institution as possible (Punch, 2005). Thus I wanted to ensure as much variation as possible in picking out the final projects for investigation. This is a case study and not a study aimed at broader generalisation based on a representative sample. However, recurring patterns of interaction in several cases with fundamentally different actors could perhaps suggest a greater probability identifying possible general patterns of interaction in such projects and indicate more robust results.

Of the six cases finally investigated, two included a university as partner, and four of them included a research institute as a partner. The projects were situated in different parts of the country and received funding from one of 4 different research programmes in the RCN, placed in both the Division of Innovation and the Division for Strategic Priorities. The firms were of different sizes, ranging from under ten employees to several hundred employees. In my opinion this procedure ensured the selected projects or cases to be relevant both to my conceptual framework and the research question.

## 4.3 Collecting and processing the data

The term “data collection” gives the impression that data is simply out there somewhere, ready for collection. Andersen suggests that a more appropriate term might be “data construction” (Andersen, 1997). The data is always reliant on the researcher, and not a direct reflection of reality. The researcher is invariably a part of the empirical context she ventures to investigate, and this must always be taken into consideration.

### 4.3.1 Interviewing

I found conducting interviews to be quite challenging. First of all one needs to create an environment in which the interviewee feels relaxed and comfortable, in order to secure honest and comprehensive information. At the same time you should ensure that you ask all the relevant questions without repeating what the interviewee has already conveyed during the course of the conversation. Though equipped with an interview guide, I ventured to let the conversation develop and take its natural course while keeping an eye on the central questions.

Despite having the potential for being a challenging form of data collection, there was never any doubt that this was the approach most likely to yield the most suitable data in answering my research question. Information obtained during such an interview is invaluable. It is also much easier to contact the interviewees again for additional information, in case some essential questions were left out, forgotten, or came in at a later stage in the process, after first having made face-to-face contact with the interviewees.

The same interview guide was used in interviewing both sides. In each project there are at least three people who can be considered relevant interviewees: the project manager, the formal contact person representing the project owner, i.e. the firm, and the contact person representing the academic partner. In order to collect usable data, I was dependent on receiving a positive answer from at least one person from each partner in each project, but preferably all three of them. I initially contacted the project manager of four different projects, but delayed answers and a short time-frame to conduct the interviews prompted me to contact additional projects. This eventually resulted in confirmed interview appointments with representatives from both sides of the partnership in six different projects. A pilot interview with the project manager of a seventh project was conducted before starting the actual data collection. The pilot resulted in only minor adjustments of the interview guide.

A total of 17 people were interviewed. The number of interviews from each project varied somewhat due to the fact that in some of the projects the project manager and the firm's official representative was one and the same person. In addition to this, one project owner's representative failed to answer my repeated requests for an interview, while another project provided me with an additional interviewee. However, in all the projects used in the analysis both partners, or both sides of the table, have been interviewed.

All the interviews were carried out face-to-face, and in all but two instances I travelled to where the projects were situated and conducted the interviews in the interviewee's own familiar environment. All the interviews were recorded with a digital mini-recorder and then transcribed in full before commencing the analysis. Through transcriptions and processing, some holes were revealed in the data material, and questions in the interview guide were inadvertently left out or overlooked. In these instances I contacted the interviewees via e-mail or telephone for follow up questions.

The use of a digital recorder enabled me to devote my full attention to the interviewees during the session and also capture every detail of what was said, ensuring a minimal loss of data. There is of course always a danger that a recorder will cause a disturbance, in that it makes the interviewee feel uncomfortable and affects the answers given. Naturally, all interviewees were asked to give their consent before starting the interview and none of them appeared uncomfortable being recorded. The recorder was small, thus not claiming any "space" in the interview setting itself.

### **4.3.2 Processing**

Processing qualitative data is always a challenge. The transcribed interviews amounted to a little over 200 pages of text. The data was processed in three stages, based on Miles and Huberman's framework of qualitative analysis: data reduction, data display and drawing conclusions (Punch, 2005). First the data was reduced through coding and memoing. Using a spread sheet, larger passages of text was reduced to main key words and placed in categories according to the four dimensions I had operationalised my research question into. Simultaneously, important findings and thoughts were noted down and marked in the margins of the transcriptions. Based on these stages, I then ventured to draw some conclusions regarding the characteristics of the interaction by indentifying patterns and variations in the data material.



## 5. Empirical findings and discussion

This chapter will outline the empirical findings based on the interviews conducted, the documents studied and a discussion of these findings. Answering the research question I have posed, *what characterizes the interaction between a firm and a research institution who form an alliance within the BIP framework*, entails a close examination of how the actors perceive each other, communicate, co-operate and what kind of relations they form.

This chapter is organised in three different parts, confluent with the three main analytical concepts that will be used in the discussion: network resources, relational and structural embeddedness and strong and weak ties. In each part, the main empirical findings will be outlined, then discussed and tied to the analytical concepts. All interviews except one was conducted in Norwegian, thus I have translated all but one quote appearing in the text into English. In the description of the two partners of a BIP project, the partner signing the contract with the RCN will be referred to as the industrial partner or the firm, where as the partner signing the consortium agreement with the firm will be referred to as research partner or research institution. The research partner will also on occasion be referred to more specifically as a research institute or university. The more general term “alliance partner” may be applied to either of the sides.

### 5.1 Network resources

#### 5.1.1 The organisations’ surroundings and relations

The projects investigated consist of two formal partners, one firm and one research institution. The academic partners in the projects investigated are made up of two universities and four research institutes. The firms in the projects investigated range from small businesses with under 10 employees to large companies with several hundred employees, with operations both nationally and internationally. There is a great deal of variation among the actors in the projects both when it comes to the consciousness of the social relations in which they are embedded, who they think of as potential alliance partners and what kind of formal or informal networks they have a connection to.

### *Suppliers and customers*

The firms are first and foremost focused on two groups: suppliers and customers. Four of the firms describe that they are very alert to their customers' needs, the customers' part in developing the projects and the customers as formal alliance partners. Says one firm representative: "A large part of our product ideas come from customers." The same firm also frequently includes the customers in formal partnerships in developing their products, often right from the start of a project, in order to gain a grater insight into what is actually needed, and how to meet this need. "We have a tradition for using customers as partners in our projects. We have very positive experiences with this practice. In that way you can shape the project to provide the customer with *exactly* what the customer wants, not almost." One of the other firms describes a practice where they have a network of customers who on a regular basis are invited to test and evaluate products which are in the development stage. For one of the projects, the alliance partner in the current BIP project they are involved in is also a potential future customer and user of the project that is being developed.

One of the firms specifically point to their suppliers as the main source of knowledge and their access to new technology. The interviewee describes a situation where some key suppliers share their new products and technology with them at a very early stage, giving the firm a head start in implementing the technology in their products. This practice is built on mutual trust, market position and a long standing relationship rather than formal agreements. Says the firm's representative: "As long as you work with suppliers, the originality of your solutions is limited. What you have will also be available for everyone else. (...) We have some important partners who grant us access years before it's for instance launched at a convention."

A focus on customers is also evident for one research institute in particular, and the institute representative also refers to their potential alliance partners as customers to a large extent. He describes a calculated strategy to tailor their solutions to their customers by offering teams comprised of experts from several different sections of the institute, thus offering a comprehensive solution to possible industrial customers or partners. The institute has also entered into an alliance with a European research institute, in order to increase their attractiveness to the industry. "It is well received by the industry when you choose to team up in order to be more efficient and present a broader competence".

### *Alliance partners*

Of course, all of the organisations interviewed are included in the investigation because they have entered into a formal partnership under a BIP project, so this is also part of identifying how they perceive their surroundings and potential alliance partners. All of the research partners in the projects examined are familiar with the RCN portfolio of instruments, including the BIP and how it operates. It is generally perceived as a kind of instrument that requires a firm and a research-h institution to collaborate in order to receive grants. The research institutes examined generally demonstrate that they are intent on entering into alliances with other partners and are also very focused on participating in formal collaborations financed by the EU. Particularly one institute demonstrates an eagerness to form alliances with partners from the industry. As the interviewee puts it: “They are our livelihood”. He further explains when asked if they actively contact potential partners: “Yes, there is a lot of that. The firms are busy and have little time. If we can help them, they are grateful”. The exception here is an institute whose activity mainly lies within the area of basic research. As far as financial instruments with user-orientation are concerned, they prefer projects in which the research institution signs the contract with the RCN.

Two of the research institutions describes a proclivity to be oriented towards the major industrial actors, though not being oblivious to the potential advantages of co-operating with smaller firms, clearly demonstrated through statements like: “Of course we are interested in them, they are often research driven in their activities” and “In sum I think we grow more in contact with the smaller firms. The “locomotives” can be very preservative.” In assessing relations and potential alliance partners, one of the universities stands out. According to the interviewee here, the university co-operates with industry and other research institutes, but they very rarely actively seek out a potential alliance partners. The collaborations he has entered into on behalf of the university have always been a result of others seeking his competence in an alliance. When asked whether there were any potential partners he sought out and wanted to work with, he explained: “No, absolutely not, not on my part. The collaborations I enter into are a result of people seeking me out, I do not contact anyone”.

### *Focus on networks?*

Among the firms there are variations in how they orient themselves in relation to potential alliance partners and their awareness of the subject. One firm has a clear strategy to

becoming an attractive partner for other partners in future alliances. They are very observant of the possible advantages of alliances, and when in the process of investigating new possible markets and products, they make an effort to identify the actors with relevant competence and contact them to see if collaboration is within reach.

There is also one striking contrast that stands out among the two largest firms. They both have a separate and quite large R&D units within the company, and also R&D labs located abroad, but they reveal different views on how to pursue R&D alliances and they have a very different view on the BIP instrument as potential source of funding in this respect. Whereas one of the firms is very aware of this kind of instrument and have a clear strategic goal to continue to use and form alliances under this instrument, the second firm is not at all focused on using such an instrument as a possible source of funds. In developing their technology they rather prefer to manage on their own. One of the firms representatives says: "There is very little co-operation when it comes to developing technology. We are not focused on this at all. It's more that, on occasion things happen to turn up, and then we might get onboard." However, they do on occasion use research institutes for small research assignments, but then as service providers, performing single tasks, and not entering into an extensive contract or agreement. In the few instances where they enter into a partnership, it is mainly because the opportunity presents itself; this is very seldom driven by strategic considerations.

What the largest firms *do* have in common is that they are quite often contacted by firms or research institutions who want to co-operate with them because of their size, reputation and market position. As the representative from one of the firms explains: "They recognize that we are big, and that we have networks." This is also pointed out by the representative from the other large firm. He maintains that this is actually one of the advantages of being a market leader, that ideas often come your way. In some cases even, competing firms have contacted customers, whereupon the customers then bring the idea in to the focal firm for development, because they trust them to produce the best result.

One representative of a research institute' also maintains their attractiveness to potential partners: "The knowledge embedded in activity like ours is extensive. For a firm, getting access to this knowledge is quite attractive."

## *Formal networks*

Four of the research partners and two of the firms in the investigation mention that they are a part of organised research networks or other networks that are more formalised in the way they operate. The networks are both national and international. There is significant variation in how these formal networks and the opportunities they represent are perceived. One of the research partners interviewed reveals that one of their formal international networks is probably the network that has yielded the most concrete results in terms of ideas for projects and co-operation on applications for EU-financed projects. However, the interviewee also expresses scepticism towards several formal networks that has been established in the region, with the aim of creating new projects and new ideas. He explains: “What do we actually get in return for attending these meetings? I have often wondered how these things are established. What is it that makes everyone so sure this is a good thing? (...)There is too little substance and too much show.” However, he also underlines the difficulties in assessing these kinds of networks: “I might be underestimating the value, I do actually acquire a network I might use someday. But there is a balance there that is really difficult to maintain.”

### **5.1.2 Choosing a partner and formalising the alliance**

At some point, the partners in a BIP decide to enter into a formal alliance with one specific partner and the agreement will have to be formalised in some manner. There are several aspects to investigate: Why do the organisations choose to enter into an alliance in the first place, and why do they choose to work with that specific partner? Once the choice has been made, there is also a question of formalising the alliance. The interviews reveal a number of reasons for choosing that particular partner and also some central issues surrounding the formalisation of the alliance.

#### *What to look for and where to look*

Of the research partners, all but one of the research institutes mention the financial motivation for entering into the alliance. They depend on obtaining additional funding for their continued activities. However, this is not the only reason given in the interviews. Common research and professional interests and access to the developed technology are also referred to, and also, as mentioned above, one of the institutes has an interest in one of the products as a future customer. The university representatives interviewed are almost

exclusively focused on the specific subject of the research, the common research interest of the partners. One university representative points out the value of maintaining industrial activities within this specific field as an important reason to co-operate on the scientific basis for that particular project.

For the firms, the most common reasons stated for co-operating with an external partner in the projects examined are access to the right knowledge for the specific problem to be solved, and access to equipment which they do not have, nor plan to acquire themselves due to excessive costs. As specified by one of the firm's representatives: "In the initial phases of a project it would be too expensive to both hire staff and acquire the necessary equipment. By contacting a research institute, the project can be in operation from day one." This is further supported by another firm: "We don't have the opportunity to buy all the equipment we would need, and it is very expensive and time consuming to build a whole laboratory."

As described above, most of the actors are of understanding that it is a formal requirement to include a partner from a research institution in the project in order to receive grants under the BIP framework. As also described above, this is not a formal requirement of the application type itself, but the way the instrument is implemented in the programmes within the RCN clearly indicates that forming research alliances is seen as an important part of BIP projects.

When it comes to the significance of geographical proximity as a factor in choosing an alliance partner, it is possible to distinguish three different main views among the actors in the projects investigated, with no particular distinction between the firms and the research institutions: There are those who actively seek to co-operate with partners in the same region of strategic and practical reasons. When asked whether or not they orient themselves towards local partners, a firm manager explains: "Well, actually we do that first. We do have the growth of the region somewhat in mind (...)." However the same interviewee also explains that proximity is not decisive and that they will look elsewhere if regional partners are unavailable. Then you have those who say that co-operating with a local partner is practical, but they are not particularly active towards potential local collaboration partners. And finally, the research partner in one of the projects represents yet another position. For this institution it has actually been a goal to avoid a "regional profile": "It has never been natural for us, and never will be. We are more oriented towards sectors (...) It is actually rather remarkable how little we co-operate with local actors."

### *Challenges in formalising the alliance*

When having localized the specific partner, the relation must be formalised in a consortium agreement. As referred to in chapter two, this is now a requirement for all firms and research institutions entering into alliances in a BIP, and has been so since the start of 2009. The consortium agreement is among other things supposed to deal with Intellectual Property Rights (IPR).

### **Consortium agreement and IPR issues**

Several of the projects investigated turned out to have met with challenges in finalising a formal contract of the co-operation, mainly connected to reaching agreement on rights to commercialise the results and publishing scientific articles on the research and the results.

In one of the projects, the firm is currently co-operating with a university in a project, and has also co-operated with this partner in a previous BIP. The previous BIP involved the same people and department as the current project. The first project was initiated some years back and did not include a consortium agreement, but was mainly based on trust and a mutual understanding of how the project was to be carried out. However, in negotiating the current project there were some challenges in finalising the agreement. The manager of the firm in this project underlines that the universities in general have become much more aware of and occupied with securing the rights to the results of the projects they are involved in, with respect to a potential financial gain. He further points out that this is a challenge for small firms but may also be a challenge for research and development in Norway in general. Following a period of discussions and negotiations the partners were able to find a solution, but the process was time consuming and resource demanding. Says the manager: “The large institutes and the universities should handle it in a more relevant manner and not be so rigid in their demands.”

An interviewee representing one of the universities states that solving IPR issues may have the potential for wearing on a relationship between two parties, due to the lack of capacity to attend to such matters. Says the university representative: “This has been introduced to us from outside the institution. There are no driving forces internally in academic circles focusing on these issues. So this is an evolution.” He further argues that when you draw up a legal document, it has to be waterproof and is usually made to cover for a worst-case scenario. He says that this can be time consuming and take focus away from the matter at heart: the research. He points out that the model contract made and published by the RCN to help in these matters is too vague and does not take into account that the agreement

is to be formed between two parties that have fundamentally different agendas. The university is supposed to be an open institution, communicating knowledge. The firm is interested in securing rights and a return on investment, i.e. securing their future. The requirement to enter into a formal contract may potentially put a strain on the relation between the parties who are used to building their relationship on trust.

That dealing with IPR and formalising an agreement between parties in an alliance can be a challenge is further pointed out in interviews with partners in another project. This project also ran into some quite challenging discussions solving their IPR issues. The discussion had lasted for over six months at the time of the interviews. In this case the research partner was not intent on giving up all the rights to the results, which in their view was based of their competence built up over a number of years. The firm on the other hand was interested in protecting the rights to the technology on behalf of potential investors. The firm representative explains: “It is really critical to negotiate a clear agreement on those issues. The most important thing for the company is no barriers to commercialise.”

There’s a great difference in how the different institutions are equipped or are capable of handling a dispute on IPR. Some of the larger firms have their own lawyers as part of their staff. The universities have a greater focus on this and have a separate legal unit tending to these issues or they seek assistance from Technical Transfer Offices, located at the universities. For small firms however, or in one of my cases, a research institute unfamiliar with working within a BIP framework and having to solve such issues, these matters may cause delays and tension as well as being an unforeseen cost into establishing the project.

The fact that signing a consortium agreement has become a requirement also prompted some reflections from one of the firm representatives:

*“Interestingly, the issues of IPR may also change the choice of partner. It will be easier with an instiute who does not want to hold on to all the rights. If I could work with an institute in Sweden that would let me keep all the IPR, well what would you choose? There has been a change in the system and you would have to look closely on what gives the best results”*

Though the new regulations and the model contract for a consortium agreement published by the RCN is obviously causing trouble for some, the agreement proved useful for at least one project, as the research institute were apparently eager to use their standard agreement, but the firm insisted on using the RCN model contract, which was eventually accepted by the research institute. There are also examples among the projects that negotiating IPR and formalising the agreement has been relatively easily achieved. A research partner in one of



the projects points out that they keep the right to use the knowledge acquired through working on the project, but the firm keeps the rights to the results of that particular project: “Where the industrial partner is involved and pays for the research, they are granted the rights to the result of the projects.”

In addition to the challenges described above, another firm pointed out still another problem with the new regulations demanding a formal agreement to be in place before the contract with the RCN can be signed and the project officially be underway: Drawing up the agreement is time consuming and makes it difficult to follow the other formal regulations of the projects. For instance, the money allocated in one budget year must be spent in that same year, and this is often impossible seeing as they cannot officially start the project before the consortium agreement is signed. There is a discrepancy there between what is possible and what the formal requirements are.

### **Publication and disclosure**

In connection with formalising agreements between the alliance partners, still another issue was brought to the fore through the projects investigated, and that is the issue of publication of scientific results from the projects. One of the firms points out that this is an increasingly challenging area, since the requirements to publish results from publicly supported research projects are growing. Therefore, it is increasingly challenging for the firms to engage in these kinds of contracts without risking that valuable knowledge is disclosed to potential competitors. The interviewee states that this is a more prominent issue when working with the universities, because it is part of their mandate to lecture, educate and spread knowledge. When working with a university you have to restrict the co-operation to issues that are not sensitive, and thus limit the co-operations. Because they are a public educational institution, you have to respect their need to publish the results. However, this has implications for the interaction and may lead to restricted openness in the co-operations. The firm representative explains: “With universities this is definitely a subject of discussion. Simply put, this means that we do not disclose information that may be of use to us, and be harmful if published. This results in a less open relationship.”

This is also pointed out by a second interviewee. He explains that the result of this is that some of the major actors of the industry simply may not disclose the most important goals or research topics, because this is also of the utmost value to the firms. The industry will never actually part with or share their most important technology in projects like the

BIPs, or use the research resulting from these projects in their most important technological developments. They may conduct collaborative research with academia on issues that are related to their main areas of priority, but they will not disclose their most prominent competitive advantages. Says one of the interviewees: “There will always be an inner core that we will not be allowed to see.”

Another university employee expresses a slightly different view: “It is generally a problem that the industry wants to keep their cards hidden. The University wants to publish and the industry has a different method. There is a tension between business and research, but definitely nothing that cannot be solved.”

The above sections have dealt with how the projects perceive their network resources, their decision to enter into an alliance, aspects of the motivation for choosing a particular partner and the formalisation of an agreement. All of these issues are prominent in influencing the interaction between the parties of the alliance.

### **5.1.3 Network resources –discussion**

How is the interaction shaped and influenced by the network resources of the parties of such projects? In order to understand the interaction between the actors in a BIP in light of Gulati’s network resources, it is necessary, as I have done above, to describe social circumstances of the actors and how they perceive themselves and the surrounding networks. This gives some understanding of what landscape they move in, which potential partners they might have considered or not, and their motivation for choosing one partner over another. Some of the findings show that the firms in the six projects have a different perception of their network resources and that this in turn may shape their seeking out, assessing and teaming up with various alliance partners.

Through the interviews with the organisations examined here, attention seem to be focused on one or maximum two main dimensions of Gulati’s model of network resources. When asked to elaborate on their network and potential partners, the interviewees focus on customers and suppliers and/or R&D alliance partners. According to Gulati, the more successful companies differ from the less successful in the way they choose to build and accumulate their network resources. In Gulati’s view it is the number of ties that you have in each of these dimensions, but also the qualities of the ties you have that determine your

network resources. A closer look at the organisation involved in BIPs in light of Gulati's framework can thus illuminate whether or not these organisations can be seen, or see themselves, as resource-rich organisations. According to Gulati, what distinguishes the more successful firms is their ability to develop a holistic and multidimensional view of their network resources and make the dimensions work together. However, in investigating the actor's own perceptions of their networks and ties in these projects, it is difficult to clearly separate which actors belong to which dimension. I describe the relationship within the BIPs as alliances, but there are many similarities with Gulati's customer and supplier dimensions. For instance, as described above one research institution has made a deliberate strategic choice to put together teams with knowledge from different parts of the organisation, thus providing the firms with which they interact with a comprehensive solution. For research institutes, a firm collaborating in a BIP may be seen as a customer and not as an alliance partner.

Gulati's dimensions of network resources are made up of several steps, visualised by the rungs of a ladder. Each step on the ladder symbolizes increased mutual commitment, trust and responsibility. In one of the projects I explored, the manager of a firm-co-operating with a research institution experienced increased interest and enthusiasm from their alliance partner. The manager referred to this as "climbing another step on the ladder."

In the examination of the projects, I also found that the process of formalizing agreements, i.e. drawing up a consortium agreement may influence the interaction and the relation between the parties of the agreement. For instance, one of the projects examined started out with a collaboration that was not based on a formal agreement, a trust laden, open relationship pointing to the top of the ladder. After introducing the formal agreement to be finalised, particularly focusing on IPR issues, the trust was challenged, suggesting a lower rung of the relationship ladder of alliances, though this may be a temporary stage. The descriptions above also point out that the industrial partners may be reluctant to share information with their research partners. There is also scepticism from academia towards how much openness one can count on from the industry in such projects. This also suggest that in some cases it may be difficult to move such a relationship to the highest rung on the relationship ladder.

Gulati maintains that network resources lead to sustained competitive advantage. One project displays some evidence of this. They are often contacted by both customers and potential partners who wants to work with them, and want them to find solutions because

they believe they are the most capable to find the right solution to fit their needs. The relations they already have create a bond where the customer trusts them. The leading market position they have and their work with prior partners in R&D leads to them being contacted by partners who want to work with them. As described above, in one case a firm competing with the focal firm approached a customer with an idea, only for the customer to turn around to the focal firm, asking them to develop the technology. This of course builds on close relations and extensive trust, to a large degree, suggesting a high rung on the relationship ladder.

In another project, the firm enjoys close ties to its suppliers who are their main source of new technology. As stated by the firm, the originality of the product is limited when you acquire something that has been developed by others. For them, the key is to cultivate a close relationship with the supplier, high up on the relationship ladder, securing them access to the new technology before everyone else. This relationship is maintained without any formal agreements, and a high degree of mutual trust, suggesting a position high up on the relationship ladder.

## 5.2 Relational and structural embeddedness

### 5.2.1 Tracing the origin of the alliance

In examining the interaction between the organisations, the above description among other things provides some insight into what kind of resources the organisations were looking for in a partner. Another important aspect of the motivation for choosing a partner is where the *information* about such resources originates. Tracing the origin of this information would lead to a more comprehensive picture of the origin and formation of the alliance. In tracing the origin of the alliance it is necessary to trace the origin of the projects which are the point of departure for this study, and the formal framework of their current alliance.

#### *The origin of the current project*

In four of the projects examined, the initiative and the idea for the project and the alliance came from the industrial partner. In one of the projects, the initiative and the idea clearly came from the research institute involved as a consequence of the institute developing a basic technology and patenting this technology, then actively seeking an industrial partner for

further developing the technology. The representative from the research institute explains: “If you wish to maintain the technology and the patent, you have to have someone who pays for it.” He further elaborates: “It is not our goal to keep this technology to ourselves, so we have been out promoting it, not only in Norway but also to other producers.” In one of the projects, the origin of the project seemed somewhat ambiguous, but it appeared that the idea originated in a firm currently collaborating with the focal firm, then following an employee of that firm over to the research institute and then back to the focal firm, where discussions were started on how to pursue this idea in co-operation with both the research institute and the collaborating firm.

### *The origin of the alliance*

However, during the course of exploring the origin of the project and the relationship of the current partners, it became clear that in most cases the origin of the alliance had preceded the origin and the formal establishment the projects they were currently engaged in and which I had picked out for investigation. In this respect the picture proved to be complex and multifaceted.

In two of the projects, the alliance partners had long standing, stabile and close relationships before the current project and had been co-operating in formal projects over many years, projects both with and without partial funding from the RCN. One of the firms displayed a clear and long term strategy to maintain a close relationship to this particular research partner, even to the point of taking on the research partner’s representative as part of their staff, in a part-time position, in addition to forming an alliance under a BIP. Says the firm’s representative: “This is not an idea that we’ve suddenly had, this is a long term co-operation which has now resulted in a potential marketable product, as we see it.” The other firm in this category has also mainly had alliances with one particular partner. Says one interviewee from the firm: “We work with them on this project, we worked with them on the previous projects and long before this. (...) We have good relations to this institute; also personally, we know a lot of people there.”

In one of the projects the firm had collaborated with the research institute in several projects preceding the current one, but different parts of and different people within the institute. Thus, the two organisations as such had co-operated over several years, but not necessarily the same people within the organisation.

In two of the projects, the current project had been preceded by a fairly recent RCN funded project, also a BIP, with the same partner and to some extent on the same subject. In this respect the current projects could be seen as building partly on the results of the previous ones. In these instances the alliances between the parties were formed in connection with the first project grant from RCN and had then continued in the current project. In one of these projects the firm had previously used their current research partner for minor research assignments, but not engaged in a long term formal contract before they entered into their first RCN funded BIP. In the second project in this category, there had been no collaboration between the parties in the project before their first RCN funded BIP. The partners knew *of* each other and were aware of each other, but did not have any proximate ties.

In the last project investigated, the firm and the research institute had not previously been engaged in any form of collaborations before the current project. However, there were ties on a personal level between employees at the research institution and in the firm.

### *Personal contacts*

In fact, the importance of personal contacts is pointed out by a number of the interviewees. A representative from a research partner says: “The intention is that those who have status as researchers are expected to bring their personal network to the institute and are expected to use it actively.” Another research partner states: “(...)if the framework conditions are right, it is in a way in the personal relationships that you see the greatest benefits, the greatest value for us. I mean locally, for me as a researcher.” He further elaborates: “But perhaps it is how research works. It’s the individuals who are part of a system. You depend on singular individuals to push things forward. At least that’s how we work.” The industrial partners in the projects also point to the importance of personal relationships. A firm manager explains: “Almost all contacts are based on some kind of personal relationship.” In these descriptions of their potential paths to new alliances and the origin of information that may take them in that direction, the interviewees convey a situation where the direct and proximate ties appear abundant. But as underlined by a representative from a research institute, each individual is of course important in alliance formation, but their contact points are also inextricably bound to the organisation they are employed by: “I, as a single individual use my personal network, but I usually don’t think about why I have this network. But I see that without a number of formal structures, I would not have the same network.”

### *Importance of financial support*

All except one project underline the point that the project in its present form, entailing such a close collaboration with a research partner, would not have been initiated or even possible without financial support from the RCN. Says one of the firm representatives: “The support made it possible to engage an external partner for R&D, so the funding was quite critical.” Four of the firms indicate that they that they might have engaged in collaborations with their chosen partners even without financial support, but the projects and the collaboration would have been significantly different. One of the firm managers explains: “We would have liked to co-operate, but the economic situation would have limited the collaboration severely.” The manager emphasizes the importance of a funding scheme like the BIP as a condition for the origin of both the project and the alliance. All except one of the firms confirm that they, in theory, could have chosen other partners to work with if they had to, so the choice of partner in most cases was not restricted to just one possible option.

### *Structural factors*

None of the projects or alliances investigated in this context was the result of information originating from a common third-party collaborator, though this is a bit ambiguous for one of the projects. However, there are some statements that suggest that the present alliances may provide a new way in to future alliances, both for the firms and the research partners. One of the research institutions points out that they are quite conscious about bringing new partners to the table in various projects, who may then team up with the firm in future projects, and that this may be convenient for both the research institution and the firm. This is potentially beneficial for both parties: the research institute will have a good argument for bringing industrial participants into projects where this might be required, in EU-financed projects among others, and the firm may potentially find new partners for future alliances. The research institute employee describes: “It’s crucial for us that we get other partners in that may be of use to them, partners that they appreciate. Because then they will expand their network too. (...) They get access to new environments and new contacts.” A representative from a firm states: “Our research partner has a network that we also can take advantage of, and to some extent this is done in the project.”

In this context also, the importance of contacts on a personal level is mentioned, though not necessarily proximate or direct. “If you yourself don’t have any contacts, you can always call a friend, who will have a contact, and there you have it” one of the interviewees

explains. On this note, several of the interviewees commented on the fact that the situation in Norway is actually quite special, seeing as the country is quite small in size and the research community and industrial community within specific fields may be quite transparent. Says an interviewee from one of the research partners: “The environment in Norway is so small, there are not so many places you can go. If you take the USA for instance or other places in Europe, this is enormous in comparison. There are so many constellations you can seek out.” A firm representative says the following about networking on national seminars or conferences: “You end up meeting a lot of the same people most of the time. In addition to those you know from your days as student.”

### **5.2.2 Relational and structural embeddedness –discussion.**

Relational and structural embeddedness are components of network resources which say something about where the information that is a part of the network resources originate. This entails tracing the origin of the project idea, and through which paths this information finds its way to the alliance partner, thus building the foundations for an alliance.

The forming of an alliance is driven by actors’ social context. The social networks which actors are embedded in also influence flow of information between them. In order to understand how organisations operate when embedded in a number of ties, it is crucial to understand the circumstances which are associated with these ties and how organisations learn about new opportunities (Gulati, 2007).

The exploration of the projects show that in most instances the idea for the project originated in the firm and that information originating in relational components of *the firms’* network resources proved to be important for the choice of partner. As the description of the empirical findings above indicates, the link between past alliances or dealings and future collaborations are reflected in several of the interviews. Among other things, this is underlined by the fact that several of the firms state that it would have been possible to choose another partner, but that there were distinct reasons to choose a partner with whom they were familiar in prior dealings on an organisational level, or trusted on the basis of direct or proximate personal links.

As the above description shows; if the partners have not been engaged in prior dealings on an organisational level, there are often personal relations between the organisations, constituting direct and proximate ties, securing access to trustworthy and low cost information about the potential partner. This underlines the relational component of the



network resources of the organisations involved in my investigation. Thus it seems that relational components have had an influence in most of the alliance formations. This is also underlined by the fact that for most of the firms, there are potential alliance partners that have the same competence and could have contributed equally to the project at hand. However, their choice of partner in many cases rested information originating in prior dealings, as brought out in the interviews.

My description above shows that none of the alliances formed in the projects I examined were described as established on the basis of access to information from a common third partner. In this respect, the structural component of the network resources of the firms investigated are not evident. True, some BIP alliances were formed without prior direct or proximate organisational ties being described by the interviewees, but in these instances, information conveyed that personal relationships played a part. However, the BIP's role in enforcing the structural component of the network resources is brought out through the expressed hopes of gaining access to future collaboration partners through their current partners. As described above, several of the interviewees pointed to potential advantages in gaining access to information on future alliance partners.

In exploring the significance of the funding within the BIP framework, a majority of the firms expressed that the project and also in many cases the alliance would not have originated without financial support from the RCN. This highlights the role of an instrument like the BIP for network resources.

In two of the projects there had clearly been an attachment over a long period of time. This had led to the accumulation of experience through their interactions, and this played a central part in the formation of the current alliance in the BIP project. This suggests that the BIP serves as an element in maintaining and strengthening already existing relations and reinforcing the relational component in future alliance formations.

For three of the projects, the alliance between them was first formed in connection with a BIP, and the partners in these projects had not engaged in a long-term collaboration prior to engaging in a RCN-financed project. Two of these were now currently working on their second BIP. This suggests that an instrument like the BIP can play an important part in creating new collaborations. The representatives from the projects indicated that an alliance might have been formed without financial support from the RCN, but that the collaboration would be fundamentally different.

## 5.3 Strong and weak ties

### 5.3.1 The nature of the relation

The previous section divided its attention to the origin of the information and the initiative that led to the formation of the alliances in the BIP. In this section, I will describe aspects of the relation from a slightly different angle. In Gulati's framework a direct tie between two organisations represents a prior relationship between them and falls under the relational aspect. However, the nature of the relation may still vary and need not necessarily be strong. One of the projects provides an example of this: The research partner in this project was contacted by a firm which wanted them on board for an application for an EU-project. The firm and the research institutions had previously been in contact with each other, but that was somewhere between 15 and 20 years ago. In this case, the origin of the information that provided the firm with an access point to the research institution was of a relational nature, because of the direct link from the past dealings. In this case, the new-found alliance originated in prior dealings and direct ties to the organisation, but was not a particularly strong relation.

Five of the firms confirm that establishing the project and the alliance has strengthened the relationship to their present alliance partner and that it is very likely that they will choose the same partner for a future alliance. Several of the interviewees also point out the positive sides of building a strong relationship. One interviewee points out that the reason he views a strong relation as positive, is the firm's extensive contact network in Europe. Says the interviewee: "I view the strong relationship as solely positive, because we also have such a good contact network in Europe. If their knowledge proves to be inadequate in some fields, I can always find some one abroad."

The variation of the nature of the ties in the process of finding partners for the project will be exemplified through a description of three different projects in the study: One of the projects in my study frames an alliance where the focal firm has worked with the same research partner for many years. The research partner in question finds the research interesting and the collaboration itself works wonderfully, as described by both parties to the alliance. The ties from the firm to the research partner goes a long way back and there are a number of people in the firm who are in contact with people from the research institution. These are the ties that form the basis of the alliance of RCN financed project they are

currently involved in. If the project is successful, the result is described by the project partners as an incremental innovation.

In one of the other projects, the focal firm had co-operated with a research institute in several projects prior to the current one. However, in the current project, the firm needed competence in a field that differed from their previous projects. Knowing the research institute well, the firm representative contacted the research institute and was provided with a name of a researcher in the right field. Following this, the collaboration was started with this department of the research institute. This innovation that may come out of this project, if successful, is characterized by the project manager as an advanced innovation. In the last project in this example, the situation was different. When looking for a partner, the firm manager received a tip from an old colleague that there might be a research group at a university that could be relevant for his project. The firm manager knew *of* the researchers at the university, but did not know the people involved particularly well prior to the first contact. If the project they are currently engaged in proves to be successful, the research partner and the firm alike characterize this as quite a radical innovation.

### **5.3.2 Strong and weak ties – discussion**

In the cases I have explored it is difficult to categorize a tie as either strong or weak. These are not clear categories with clearly defined criteria, rather it's a question of viewing the ties along a continuum ranging from strong to weak and assess whether or not the bond is closer to one end or the other of this continuum. It is not possible to categorically describe a relation as either strong or weak in the cases I have explored, but it is possible to indicate whether they lean towards the *weaker* or the *stronger* end of this continuum.

In the section above I have described three different projects. In the first project, the ties would lean towards the *stronger* side of the continuum. In the two other projects, the tie that led to the initial contact between the contact person from the firm and the research institution respectively can be said to lean towards the weaker end of the continuum, most evident in the last project. In this case, the firm's manager knew *of* the research group at the university and had received some information of a potential collaboration partner via a former colleague. Following the initial contact, the collaboration was started, and the result of the collaboration, if successful is characterized by the partners in the project as a radical innovation. The same can be said of the other project with initial weak ties before the current project. The firm had previously worked with the research institute, but not with the person

now working with them on trying to achieve what they also describe as a radical or advanced innovation. In this instance, it also seems like the tie served as a local bridge, i.e the shortest and most efficient path between two points. It is not likely that the path that was followed was the *only* possible route from the firm an to the new contact in the research institute, but going through the institute that they had previously used and had good connections with proved to be the most efficient way of establishing a new alliance.

In these examples, it is possible to see how the weak ties may prove to be channels for valuable information. Whereas Gulati points to optimizing network resources by among other things, climbing the relationship ladder, and thereby making the tie stronger, Granovetter suggests that important or useful information might also travel through weak ties. Granovetter also stresses the novelty aspect of information that travel through weak ties. In this respect it is also interesting to note that when asked about their perception of strong ties, all interviewees underlined the positive aspects of strong ties. In all but one project, the intention was to cultivate the good relations that had developed and make it stronger even.

## 6. Towards some conclusions

The objective of this thesis was to investigate what characterises the interaction between a firm and a research institution that decide to form a partnership in a BIP. Through interviews with the protagonists of a selected few projects, central aspects of the interaction between parties have been explored. The characteristics of the interaction are influenced by central events: the decision to enter into an alliance, the choice of a partner and the process of formalising the alliance. Where the information and idea potential partners originate and the nature of the alliance is also intimately connected to the interaction. Examining these aspects in the light of concepts developed by Gulati and Granovetter is one possible way to enrich our understanding of how a formal instrument like the BIP works in practice, how the actors think and how this affects the interplay between them. This last chapter will summarize the findings and outline the main characteristics of the interaction in connection with establishing a BIP.

### 6.1 Main findings

*What characterises the interaction between a firm and a research institution in the process leading up to establishment of a User-driven Innovation Project (BIP)?*

As mentioned in chapter three, much of the literature on research partnerships has centred on why research partnerships are formed. The motivation or reason for entering into alliances, and choosing a specific partner is one of the most important dimensions shaping the interaction between the actors, and aspects of this permeate all three parts of the description and analysis above. The investigation shows that the interaction is dependent on a number of material as well as social factors. An investigation solely focused on the material and resource considerations for entering into a partnership would be too narrow, and would miss important aspects of the interaction, e.g. the process of formalising the agreement and the landscape surrounding the actors. Through the exploration, some interesting aspects have surfaced and these will be summarized below.

First of all: what is evident from my exploration of the relationship between research partners in BIPs is that the interaction between the alliance partners is a multifaceted phenomenon and that the interaction does not happen in one singular predictable way in such

projects. The stories told above are a glimpse into how the interaction might take place in seeking out, assessing and establishing projects with an alliance partner. The heterogeneity of the actors is reflected in the heterogeneity of the interactions.

Customers and suppliers are important dimensions for the parties in the BIP projects, and in some of the cases these are equally or more important than the alliance dimension of their network resources. However, these categories are not mutually exclusive and may overlap. Participation in formally organized networks is mentioned as important in connection with finding partners and ideas for EU-financed projects, but does not appear to be an essential part of the actors' consciousness in identifying potential partners.

The formal framework of the instrument shape the way the partners interact in formalising their relation in a consortium agreement. Mainly because of discussion on IPR, the process has been a challenge for several of the projects. Another important factor connected to protecting rights and technology is highlighted by several of the interviewees, namely the industrial actors' reluctance to share their most valuable information or most important research topics with a partner who might want to publish scientific articles based on the results of the projects.

In the interaction between firms and research partners, there is no clear tendency showing that the research partner is particularly active in contacting firms, suggesting projects ideas and writing applications. In my data, there is only one clear instance where the research institute was undoubtedly the instigator of the project. And in this project, the research institute was also the actor with the original basis technology, idea, knowledge of the RCN portfolio and administrative capabilities to follow up on the project.

There are several findings that point to a clear tendency to form alliances on the basis of information originating in relational embeddedness. In these cases the BIP instrument contributes to maintaining relations, making them stronger. But seeing as several of the alliances were first established in connection with a BIP, such projects also contribute to creating alliances. The funding from RCN, as pointed out in several interviews, is extremely important for small firms, but one of the larger firms also point out that funding for such projects provides opportunities to start projects and collaborations developing new technology that would otherwise not have been developed. Their proximate and direct contacts are important, but there are also statements to suggest that new alliances and relations might arise from network resources originating in structural embeddedness.

Examples describing ties of a weaker nature, suggest that ties leaning towards the weaker end of a continuum may be important in forming alliances and lead to more advanced innovations. The examples underline that weak as well as strong ties, or relationships high up on the relationship ladder, may be of importance in optimising network resources.

## 6.2 The way forward

The findings in a case-study cannot be the starting point for general conclusions regarding a larger population in the same sense as a quantitative study. A case study is a description of reality, how things have actually happened in a particular instance, and the strength of a case study is exactly this dimension. The aim has been to provide a detailed description of what happens in practice, and in this respect the findings will provide a valuable insight into how the BIP instrument works and how the actors think.

The main findings listed above show some interesting sides to the BIP instrument. Alliances are created, reproduced and maintained under this instrument. However, the built-in structures and formal requirements of the BIP also contribute to shaping the interaction between the actors. Creating and utilizing an instrument such as the BIP requires definitions of some basic criteria for how it is going to work and who the relevant actors are. This also entails dividing the actors in the Norwegian innovations system into different categories, defining their functions and assigning them certain roles in the implementation of such an instrument. As pointed out by O. Spilling and A. Rosenberg (2007) the Norwegian innovation system has been through a phase of intense development and is still at a very formative stage. This means that a continued development is to be expected, and that this requires a constant development of the framework for stimulating innovative activities in business and industry (Spilling and Rosenberg, 2007).

One of the observations made during my investigation is that it can be difficult to place the participating actors into separate categories with clear lines and separate distinguishing features. In the projects I have examined, one research institute expressed a great deal of scepticism towards the fact that a firm should be entitled to all the rights to the results; results based on knowledge and competence built up over many years in the research institute. The research performed on the project was financed by funds obtained by the firm from RCN, then channelled to the research institute. The negotiations on IPR in this project proved to be time consuming and resource demanding. Another research institute had no

problem with performing research on demand for a firm paying them to do so, and thought it natural that the firm be the owner of all results. After all, the firm was the one who paid for this particular research, and the research institute would also accumulate knowledge which they could then utilize on their next mission to sell in a project idea to a potential industrial partner. Then there was the firm which did not finance a great deal of the project themselves, but brought in other industrial partners to finance the main part of the project, with the industrial partners then playing the role as a customer paying the project owner to perform research and hopefully develop a product that the industrial partners could eventually utilize. In this instance the focal firm was playing a role that is closer to what is generally perceived to be the role of a research institute or a university in a BIP, something that was also commented on by the firm's representative in the interview. This shows that the lines are blurry, the actors are heterogeneous and there is no simple way to predict or describe the processes and the circumstances of alliance formations within a BIP.

User-driven research is an important part of the RCN portfolio, and political signals in the most recent Reports to the Storting on research, development and innovation suggests that this will continue to be an area of priority (Ministry of Education and Research, 2009, Ministry of Trade and industry, 2008). It is therefore important to continue examining the different aspects of this type of instrument.

Of course, an investigation like this has clear limitations and much more research is needed before it is possible to draw any general conclusions on how the BIP instrument works. My investigation is quite limited in that I have only investigated a small number of projects, and also the study has focused on formal collaborations with only two partners. Future studies might perhaps also focus on aspects of the interaction in the larger consortia. Based on further investigations on this phenomenon, it might also be possible to create a typology for different patterns of collaborations in these projects.



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- List of all BIP projects with active budgets in, obtained from the Division of Innovation, May 2009
- Access to project archives for the projects investigated, mainly used as background material in preparation for interviews.

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[www.forskningsradet.no](http://www.forskningsradet.no)

<http://www.forskningsradet.no/en/Funding+schemes/1138882212929> (reading date 02.09.2009)

<http://www.forskningsradet.no/en/Application+types/1138882215869> (reading date 02.09.2009)

<http://www.forskningsradet.no/en/Userdriven+innovation+project/1195592882772> (reading date 02.09.2009)

<http://www.forskningsradet.no/en/Vision+and+mandate/1138785841810> (reading date 02.09.2009)

<http://www.forskningsradet.no/en/For+industry/1177315753937> (reading date 02.09.2009)

<http://www.forskningsradet.no/en/The+Norwegian+research+system/1138882276131>  
(reading date 02.09.2009)

**List of specific calls for proposals/programme plans from programmes using the application type BIP:**

**RENERGI**

<http://www.forskningsradet.no/no/Utlysning/RENERGI/1244734069409?progId=1079630580637&visAktive=true>, reading date 04.09.2009

**PETROMAKS**

<http://www.forskningsradet.no/servlet/Satellite?c=Page&cid=1226993690932&p=1226993690932&pagename=petromaks%2FHovedsidemal>, reading date 04.09.2009

**BIA**

<http://www.forskningsradet.no/no/Utlysning/BIA/1244734231308?progId=1119339932461&visAktive=true>, reading date 04.09.2009

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## Appendix

### Interview guide

Introduction: Presentation, background, position in the project.

### **Networks and potential collaboration partners – mapping out the surrounding and circumstances preceding the alliance**

1. Describe the organisation and its surroundings prior to the project. Particular networks or contact points:
  - a. Formal vs informal, sporadic vs regular, members of particular organisations, formal agreements, virtual networks, sectorial networks, geographically oriented networks, international networks, new vs old relations
2. Are you closer to some networks than others?
3. Are there any organisations that are more attractive to work with?
4. Has there been any involvement from organisations that have pulled out in the process of establishing project
5. Could anyone else have been included – why/why not?
6. How do you assess the organisations networks? Generally many loose connections or few strong connections?

### **Choice of specific partner in the project – forming and stabilizing the alliance**

1. What was the main reason you chose to work with this specific partner?
2. How you co-operated earlier? How and when?

3. What are the reasons for signing a consortium agreement, and not simply buy services needed?
4. Were there any specific challenges in the process of establishing the project?
5. What will each partner get out of the project?
6. Could it have been an alternative to hire additional R&D personnel in the firm instead of co-operating with a partner?

### **Origin of the idea – origin of the alliance**

1. Was the project spurred by a call from the RCN?
  - a. Coincidence or deliberate strategy, knowledge of BIP as an instrument, where have you gained knowledge of this instrument, how well did the call fit the project idea (if already under discussion), and to what extent was the project adapted to the call?
2. Did the idea originate in the organisation or externally? Where/from who?
  - a. Ideas from the organisations surroundings or networks, impulses from end-users, ideas from R&D department or other departments?
3. Is the project part of a long term strategy for knowledge building or future production, or does the project have a concrete product as a goal?

### **The nature of the alliance**

1. Did the relation change during the process of establishing the project?
  - a. Closer, more formalized contact, contact on different level (moved from management and further down in the organisation), new relations formed, additional points of contact
2. Did the interaction depend on specific competence of certain individuals?

3. Which part of the organisation was involved in the planning process?
4. How was the project organised in your organisation?
5. How was the contributions negotiated?
6. Who produced the application? Common effort, by one of the organisations?
7. Did planning the project and formalising the contact have a lasting impact on the relations?
8. Specific changes in the relation?
9. Will this alliance affect future alliances?
10. In case of strong relation: do you find it solely beneficial or could there be any negative sides to having a strong relation?