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External Patent Exploitation in a Non-Coercive way:

A case study on a multinational operating firm

Master's thesis in the Master Degree Programme, Entrepreneurship and Business Design

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"The road is long, dangerous and full of threats, but it is on that road the well-sought treasure of success is hidden"
- Hang chow

Executive summary

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Title: External patent exploitation in a non-coercive way: a case study on a multinational operating firm

Background: In our transition towards the so-called knowledge economy, intangible assets are increasingly important in the firms' effort of establishing or protecting a competitive position. The most tangible and accepted form of protection for these assets and therefore also the most understood and valued tool is patents (Ziegler, 2013).

In order for the patent to create any revenue for its holder the patent has to be exploited in some form. The traditional way of doing so is by selling products that are protected by patents, hence no one else is allowed to produce or sell the same product.

However, there are other ways of exploit patents, one of these ways are external exploitation, meaning for example selling or licensing the patent to an external actor. This form of exploitation referred to as outbound open innovation by Chesbrough (2003a) has been highly discussed over the last years.

Still, many firms are hesitant to do so, or do not manage to successfully accomplish an external patent exploitation process. Therefore this study will investigate what the perceived challenges with external patent exploitation in non-coercive way are.

Key Question: *From an operational perspective, what are the key perceived challenges for external patent exploitation /outbound open innovation, in a non-coercive way within an operating company?*

Purpose: The purpose is to create an understanding from an operational perspective what it really is that makes external patent exploitation challenging within an operating firm. The purpose is then that this understanding will help the reader to understand what challenges the operational staffs needs to overcome in their daily work.

Method: The study is an explorative theory-building case study at a large multinational corporation. Since the aim has been to explore what perceived factors that might hinder further outbound open innovation, five qualitative semi-structured in-depth interviews has been conducted in the process data gathering.

Key findings:
Three major challenges that hinders external patent exploitation have been identified:

i. Identifying what patents to focus on in relation to external exploitation
ii. The dilemma of operating versus non-operating revenue
iii. Risk assessment for external exploitation

Definitions

For this thesis, the following definitions and abbreviations are used:

IP – Intellectual property

IPR – Intellectual property right

Patent exploitation – Usage of the patents for some sort of value creation

Internal patent exploitation – The value creation through patents inside of the firms' boundaries, for example blocking others from producing what is patented

External patent exploitation – The value creation through patents outside of the firms' boundaries, for example licensing out, or selling patents

Non-coercive external exploitation – Opportunities where the potential buyer/licensee does not use/posses/infringe what is patented prior to the deal

Carrot licensing – See non-coercive external exploitation

Non-operating company – A firm that only exploit technology or innovations and holds no direct stake at the product market.

Operating company – A firm that could exploit technology and innovations but that does hold a stake at a product market associated with the exploited technology or innovation.

1. Introduction

The first section, 1.1 presents a short background to the area of research. Section 1.2 will discuss focus of previous research as well as focus of this study. Purpose, research question and limitations are found in 1.2-1.4 and finally the outline of the study is presented in 1.5.

1.1. Background

Rivette and Kline (2000) opens their "bestselling" book *Rembrandts in the Attic* with establishing that patents long has been considered to be one of the most boring subjects in the entire world. It has long been seen as defensive administrative piece of paper that was purely a legal tool to protect your inventions so that no one else would use them.

If the book would have stopped there this thesis would end here, but Rivette and Kline (2000), argue further that something has changed. Nowadays the patent lawyers, attorneys or others with a work associated with patents find themselves in the centre of the discussions at social gatherings. That something that has changed is the start of our transition from an industrial economy towards a knowledge-based economy. '

Drucker (1993) argues that what differs the previous economical stages we have went through, from the knowledge economy is, that previously land, labour and capital were used as the factors of production in economic theory, but in the knowledge economy it is knowledge that will be the primary factor for generating output. Knowledge has always been seen as valuable component and important factor for social and buss development it is not from that perspective the view of knowledge has challenge. It is the control of knowledge that is increasingly important. Petruson & Heiden (2008) exemplifies this by arguing that in the knowledge economy it is the part that controls the knowledge of how to develop the crops so that they can survive harsher conditions and not the ones control the land or plough the fields that harvest the larges profits.

Davis & Harrison (2001) argues that one way in which firms can protect, manage and potentially leverage knowledge is through turning the knowledge into of intellectual property rights. When looking into the statistics of patents filed for during the last years it becomes clear that it has been considered increasingly important to control knowledge through intellectual property during the last years. The same goes for the European patent office that also reports an all time high regarding patents granted and field in 2013. As seen in table 1 below, defensive actions taken on patents are rising to the same extent as the number of patent granted. This is not surprisingly since traditionally the most common way exploit patents are trough defensive actions towards actors that use what is patented.

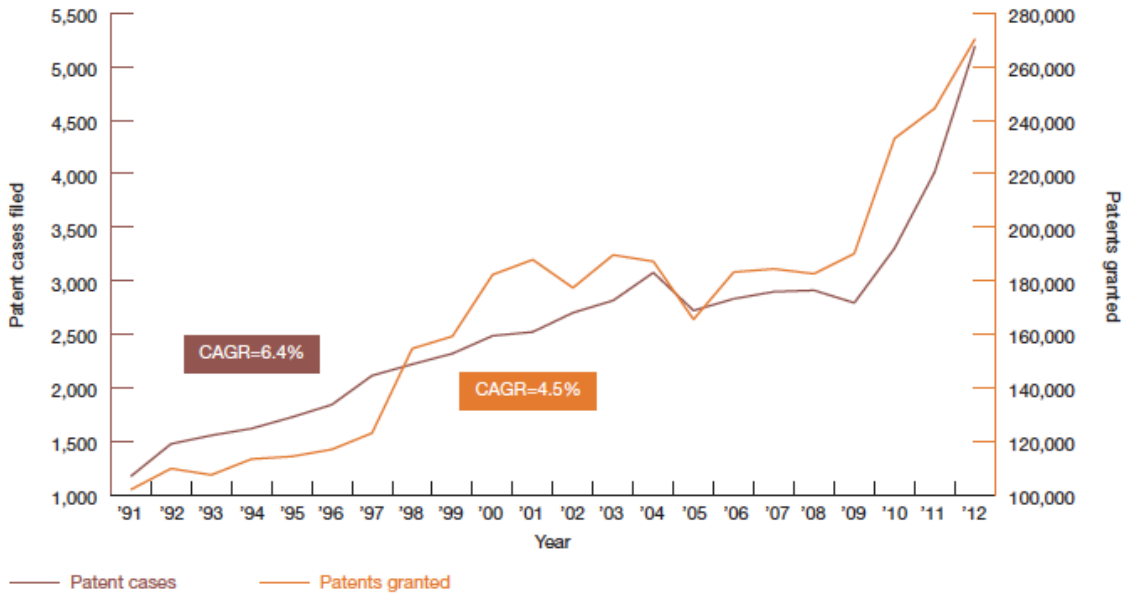

Table 1, development and CAGR of US patents filed and asserted 1991-2012. PWC (2013)

Still, during recent years, more and more companies have realised that the traditional view of R&D, as a black box where the magic happens and where the knowledge should be kept secret from the sounding world, is an expensive and sometimes ineffective way to create or secure revenue streams for the firm (Davis & Harrison, 2001). Monk (2009) argues most companies have patents just lying on the shelf, meaning patents that is not used in the firm any longer or never have been. He exemplifies with an IT-firm in Silicon Valley that between 2003 and 2006 raised their out-licensing revenues from $45 million to $300 million just by focusing more on out license technologies they had lying on the shelf and they were not even close to have licensed all of the shelf patents. Rivette and Kline (2000) argues the same way and state that many if not most firms do not realise that they have patents in their portfolios that might hold a great value for external actors. Not because the external actors infringe the patents but because they could benefit from access to the knowledge associated and covered by such patents.

In the same way Chesbrough (2003a) argues that intellectual property rights not only should be seen as a way to block actors from entering the market or stealing market shares. Rather companies should move away from that closed innovation model where everything has to be invented or used in-house and move towards a more open model where actors build opportunities together instead of block each other.

Chesbrough (2003a) present an open innovation model where the company through an inbound open innovation strategy acquire or license-in the technology needed from outside of the company, or through an outbound open innovation strategy, licensing or selling own intellectual property rights to outside actors. In this way firms will build innovation and technologies together instead of blocking each other from revenue opportunities. Kline (2003) argues that by sharing or building together around what he calls the corporate crown jewels (IP important to the firms business) to even the closest competitors the bottom line will improve, this because the firm now makes money out of transferring knowledge instead of having costs to block others from using their knowledge, or as a manager at P&G explains it:

> *"I have got it (the technology) and you have got it and I make money when I sell it but I also make money when you sell it!"* (Kline, 2003)

Still companies do not offer everybody a license on what they have invented as Proctor & Gamble argues that they do (Sakkab, 2002). Instead companies still protect what is theirs by legal rights in order to block competitors from entering their markets. In this way companies hold major assets that they do not leverage in the way they have the potential to do, if they were to manage their intellectual property in a "better" way. (Davis & Harrison, 2001)

So when knowledge becomes the most important factor for a firm in the struggle to sustain or create competitive advantage or growth it will be of utmost importance to understand what it takes from a firm to build defend and leverage these intangible assets. Building and defending is something that firms tend to focus on as seen in table 1 above but what about the leveraging part? How does a firm make money of their knowledge in other ways than just taxation of actors that are infringing their patented technologies?

One way of leveraging intellectual property is through licensing selling, our otherwise exploit patents outside of the firm. This could be done either through demanding taxation from actors that do infringe (stick licensing) or through identifying of organisation or markets that could benefit from the patented technology if they were to start using it (carrot-licensing). Harrison & Davis (2001) argues that "hunting" infringers is just a prolonged arm of the defensive step and does not utilise a further spread of technologies that could enable a larger source for present or future revenue. The carrot licensing approach also has the opportunity of that the deal is not made under threat as in the case of infringing, hence Harrison & Davis (2001) argues that a potential technology transfer could be made both inbound and outbound enabling not only a monetary but a technology leveraging of the IP. Through carrot licensing the firm could also enter new partnerships and new markets together with partners instead of through threats. In this way money is made out of a win-win situation where partnership is established instead of a threat where the firm risk creating an enemy that could turn back on them in another case or make sure that patent holder will struggle as much as possible. But still Chesbrough and Crowther (2006) argue that outbound open innovation is less frequently used than assertive strategies towards potential infringers as a way to exploit patents. One reason for this might be that it is more challenging to actually transact technologies and not only rights in an efficient way compared to filing a law suit towards an infringer.

As discussed in the literature review, below in section 3, researchers such as Lichtenthaler, Chesbrough, Kline, Harrison etc. have all done research on this subject of external patent or technology exploitation in order to understand what it takes for a firm to be successful in external technology exploitation. In their studies the research takes the standpoint from a top management perspective. The research focuses on what sort of management systems or what the biggest success factors are in order to have a successful intellectual management function or to leverage intangible assets.

This previous research has identified key challenges and potential success factors in order to conduct external patent exploitation or outbound open innovation. The findings are of course

interesting and relevant, but lack the operational perspective. The few empirical studies that have been found are focused on the view of top executives or top IP managers and not the ones who actually are working operationally with the exploitation. Further most of these studies discuss organisational or managerial challenges in relation to manage or to set up an IP organisation for external exploitation of technology and patents. These studies does identify key challenges but does not emphasize why these challenges exists from an operational perspective.

In order to overcome the challenges that are associated with external patent exploitation and thereby enabling leveraging of patents that today at many companies are a heavy burden in form of costs, we have to understand what the challenges are at an operational level. It is at this level that the actual work is done, it is at this level that the deal has to be closed. Sure a deal can be initiated at top level and almost always has to be approved there but it is at the operational level that the deal has to be closed, it is these professional that has to evaluate what can be licensed.

The research will therefore focus on exploring what the most challenge parts are at the operational level. This question will enable a better understanding what the challenges actually are made up of and an understanding of what it really is that we need to overcome when we say that it is important that the overall strategy is aligned with the IP strategy etc. By knowing this firms will have a better idea of what challenges they will face when they try to leverage their patents in a non-coercive way in order to build positive market relations and to create revenue out of the often so costly patents they hold to protect themselves.

1.2. Purpose

The purpose is to create an understanding from an operational perspective what factors it potentially is that makes external patent exploitation challenging within an operating firm. The purpose is then that this understanding will help the reader to understand what challenges the operational staffs needs to overcome in their daily work.

The aim is not to understand why traditional firms do not out-license, it is rather to understand the challenges associated with such out-licensing actives. By understanding these challenges, firms, independent on their current level activates, can see what challenges the firm that do out-license meet, at an operational level. In that way a better understanding of what is needed in order to successfully exploit intellectual property is presented, a knowledge that is needed for the firm to leverage externally knowledge that is controlled internally.

By investigating the research question the aim is that this study will help create an understanding of how to deal with these operational challenges. In that way the overall purpose is to enable a better view of what is needed to successfully conduct external patent exploitation.

1.3. Research question

Based on the discussion in 1.1 above, input from the firm studied and the literature review below in section 2, I have formulated the following research question to serve as a base for this study:

> *From an operational perspective, what are the key perceived challenges for external patent exploitation /outbound open innovation, in a non-coercive way within an operating company?*

1.4. Limitations

The study is limited to the research of one global operating firm with within several different product and service categories. The study has focused on one of these units, namely a unit within the healthcare industry.

The research is also limited to the challenges in relation to non-coercive exploitation or so called carrot licensing, meaning exploitation opportunities where the future buyer/licensee does not use/posses/infringe what is patented prior to the deal. In relation to this the research is limited to non-standard setting external exploitation of patents in a non-coercive way. This means that the study does not aim to research challenges with finding, approaching or suing infringers to patents.

1.5. Outline of the paper

In section 1, **Introduction** you will find a short introduction to the paper as well as a presentation of the research question, purpose of the research and a description of the case

Section 2, **Research strategy** will present the method on which the study is based, the methodology behind the choice a discussion regarding validity and reliability of the study.

Section 3, **Literature review/theoretical framework** will consist of at the literature review that lead to and serve as a base for the research question

Section 4, **Empirical Findings** will consist of the findings of research question

Section 5, **Discussion** will include a discussion regarding the findings in section 4

Section 6 **Conclusion** includes the final thoughts of the researcher regarding the study, what has been found in section 4, and discussed in section 5.

Section 7. **Suggestions for further research**

Section 8 **References**

Section 9 **Appendixes**

2. Research strategy

Section 2.1 Method, will describe the method used within he study, an explanation of why this method has been chosen can be found in Section 2.2 Methodology, 2.3 the present a discussion regarding validity and reliability of the study.

2.1. Method

The study is an explorative theory-building case study at a large multinational corporation. Since the aim has been to explore what perceived factors that might hinder further outbound open innovation, five qualitative semi-structured interviews has been conducted for data gathering.

2.1.1. Literature review

As a first step a literature review were conducted regarding the area of external patent exploitation and open innovation. The literature was found through university databases, Google, text and management books on the subject, input from people experienced in the area and on going input from the literature studied.

From that literature a gap was identified in the prior research, namely that almost all studies done on the subject were from a top down perspective meaning that the identified challenges and success factors were identified from the opinions of top executives rather than the employees at the operational level of external patent exploitation. As a result of this most focus were on organisational challenges and not on the perceived challenges of the everyday work.

2.1.2. The object studied

Since the research aims to investigate what the employees at an operational level consider to be the biggest challenges in relation to external patent exploitation a suitable firm had to be identified.

To investigate this a research design that could allow me to understand and explore what these workers perceived to be the key challenges was identified and the a case study was chosen. I made the choice to study one object, an operating multinational company with an established strong position both in its market but also as a respected organisation in regards to their work within the field of intellectual property management.

The firm studied are not only actively working with externally exploiting their IP, they are by many actors seen to be on the forefront of such activates. This was considered positive to the study since the aim was to investigate perceived challenges and in order to identify such challenges the process must exist, otherwise the respondents would just speculate regarding these challenges.

The case study was limited to external exploitation of IP in relation to one of the firms operating units. The unit studied within the firm was active within the healthcare industry. Hence they act on a market where they have relatively few but big competitors and where the client base also is limited due to the limited numbers of healthcare institutions in each country. This makes the competitive market fairly tough and the view of IP is relatively traditional defensive, since the blocking effect often is what is used to achieve a competitive edge at the market. Still the firm of choice actively work trying to identify opportunities to leverage their IP externally. Therefore

the firm is seen as an appropriate object of study, they act on a market with a traditional defensive view on IP, they search for and are experienced with external exploitation and they are large enough to hold experience from many cases which is needed to get a broader picture. A smaller actor might only have experience from a few cases meaning that they challenges perceived more likely could be seen as coincidences.

The respondents were chosen with guidance from my supervisor at the firm in order to find respondents with knowledge and experience within the field of external exploitation. All of the respondents in the study have worked within the corporate IP organisation of the firm during the last 7-16 years. All of them hold substantial experience and knowledge regarding external patent exploitation and the challenges thereof from multiple projects mainly within the health care field but also in relation to other more consumers oriented technologies.

Further the object studied is considered to be an operating company, meaning that they do hold a stake at the product and service market in relation to their technology. This was also seen positively since previous literature suggests that the challenges in relation external exploitation often are bigger within an operating company compared to a non-operating one.

I would argue that most firms still are operating companies meaning that the reader could to some extent relate this study against another firm within an other market with a competitive defensive IP view.

2.1.3. Data collection

During the study I spent three months at the organisation taking part in their daily work in regards to intellectual property, part of the work was in relation to the field studied some were not. This enabled me to identify potential persons that I wanted to interview but also to get to know them and build a trust prior to the interviews.

The source of data for the study has been collected through interviews with professionals working within the field of external patent exploitation at the firm studied. The interviews have been between 45 and 60 minutes and the interviewees have been given a page shortly explaining the background and what the interview will focus on about one day prior to the interview. The paper also included some example questions/topics in order to introduce the interviewee to the subject. To get this paper was demanded by the interviewees as a requirement to conduct the interview. The introduction paper can be found in appendix 1.

The interviews were conducted in a semi-structured way were the researcher had a few questions/topics that he wanted to go through but where the interview was conducted more as a discussion on the subject so that there were possible to ask follow up questions and lead the discussion towards areas of interest. Even so all major questions were asked in the same wording to the respondents.

At the end all interviewees were also asked if there was something they wanted to add and if they could summarize what they thought were the two biggest challenges of the ones we had discussed. This input was then used to "grade" the answers in terms of biggest challenge and was then used to further assess the importance of the challenges discussed during the interview.

During the interviews notes were taken by the researcher, another researcher within the same area was also present and assisted by taking notes. After the interviews both researchers transcribed their written notes and thoughts from the interview into digital form. These two transcriptions were then compared and merged into one. In this way the risk of errors or to miss certain data due to that the researcher focused on leading the discussion were lowered. The interviews were not recorded in any other way, this was a condition we had to meet requested by the interviewees.

During the interviews, several challenges that were perceived to restrain outbound open innovation/external patent exploitation were identified. These challenges spun over the entire spectrum from organisational to technical challenges. The respondents were relatively homogenous in mentioning challenges; the variations consisted of challenges that were closely related to specific work tasks of the respondents. An example of this is that one of the respondents mentioned challenges in relation to presenting know-how, accordingly his main task was to approach potential license and sell them the innovation.

The first interview was held with a group manager in order to get a somewhat more holistic picture of what the operational employees usually considered to be the main challenge, the interviewee did not focus on his job but rather what the IP councils he managed usually argued were the challenges and when they had to come to him to gain support to overcome these challenges. Four more interviews were then held with professionals working within the field of external patent exploitation.

Since I was present working at the firm studied I had the opportunity to ask clarifying questions or supporting questions to the respondents in order to clarify or complement information after the interviews.

2.1.3. Data analysis

The findings from all the interviews were merged into a table and sorted in groups dependent on the type of challenge they mentioned. The themes of challenges were identified from previous literature but were alternated during the interview period to better reflect the answers of the respondents in the study.

	Challenge 1	Challenge 2	Challenge 3	Etc.
Interviewee 1	Text	Text		
Interviewee 2	Text	Text	Text	
Interviewee 3		Text		
Etc.		Text		

Figure 1, Visualization of template for data analysis

By coding the data into types of challenges a patterns of the respondents' answers were identified. Challenge categories that all respondents had discussed were seen as more interesting than a challenge that only one respondent had discussed and the other did not consider important to the same extent. The two challenges that the respondent considered being the toughest were market with a green respective yellow colour in the table in order to visualize the importance of the findings further.

The biggest challenges were then identified and presented as seen in section 4. These challenges were then also discussed and compared in relation to the previously identified challenges and key success factors as seen in section 5.

2.2. Methodology

2.2.1. Understanding the research from an epistemological and ontological perspective

In order to be able to discuss the method and validity/reliability of the study we have to understand the research from an epistemological and ontological perspective. To keep it short one might say that ontology describe in what state something exist meaning if they are a brute fact or not? Epistemology on the other hand might shortly be explained as how do we gain knowledge of what we study.

Studying the focus of this research from an epistemological perspective I would argue, inline with Bryman & Bell (2011) that the knowledge of a perceived challenge is gained from a so-called interpretivistic perspective of epistemology. This means that the focus of the research is to understand the world through the words of the respondents and the knowledge is hence gained through interpretations of their words. This is also in line with what Bryman & Bell (2011) present as the typical approach of an inductive qualitative study.

As visualized in the research question the research focus is towards the "*…perceived key challenges…"* meaning that from an ontological perspective we cannot claim that these perceived challenges exists as a brute fact. Bryman & Bell (2011) calls this ontological position as a constructionistic one, meaning that the object researched is an outcome of social construction rather than existing out there as a brute fact.

2.2.2. The Case study

Bryman & Bell (2011) concludes that the case study is a popular and widely used design of research when the study is related to complexity or the particular nature of an object. Ejvegård (1996) continues in the same way and argues that the case study is suitable when the researcher is trying to understand the area researched from a limited number of sources. Bryman & Bell (2011) continues with explaining that what distinguish a case study from other research designs is that the researcher usually aims to explain or clarify the case studied.

Backman (1998) further defines that the case study is a useful design when studying a complex situation, organisation or object. Furthermore Ejvegård (1996) claims the case study design is appropriate when the researchers works closely to the object studied in an effort to understand the object. Eisenhardt (1989) express this clearly when stating;

> *"The case study is a research strategy which focuses on understanding the dynamics present within a single setting"*

In this study the focus is on what Eisenhardt (1989) states above, to understand the perceived challenges in relation to external patent exploitation. Further I would argue that most would consider that area to be complex area of research where the understanding that Bryman & Bell (2011) discuss is of most importance.

I therefore reasoned, that in order to dig deeper into the area and really understand, from the operational employees perspective, what it is that they consider being the challenges that hinder outbound open innovation, a case study, based on the argument above, was the most suitable research design to choose.

2.2.3. A qualitative & inductive approach

Bryman & Bell (2011) argues that the most distinguishing part of a qualitative research study is that it is the words that are in the centre of the study not the numbers, as in a quantitate approach. Holme and Solvang, (1997) further argue that in a qualitative approach the researcher interprets the data gathered, based on his knowledge, thoughts and based on that establish a theory, whereas in qualitative approach the focus is on turning already existing information into numbers to visualise a situation or concept.

Bryman & Bell (2011) explain that in a qualitative research the researcher holds an inductive approach of the relationship between theory and research, meaning that the researcher builds theory based on the research. Bryman & Bell (2011) further argue that they predominantly used approach within a case study is a qualitative and that this combination of research design leads to an inductive approach where theory is created from the research.

In this study, where the aim is to explore and understand the perceived challenges in relation to external patent exploitation, a qualitative approach to the case study is needed in order to understand the complex challenges in the study. The outcome will then be to present these findings, meaning that I will build theory from the research, in line with what Bryman & Bell (2011) describes as a typical qualitative and inductive approach to the research.

2.2.4. Data Collection

Bryman & Bell (2011) describes the interview as the most commonly used method for data collection when the research is focusing on a qualitative object. This approach is often less structured than for example a questionnaire within a quantitative research study. Bryman & Bell (2011) continue arguing that the more unstructured qualitative interview enables a better way to understand the ideas and thoughts of the respondents.

In order to enable the understanding needed regarding the perceived challenges in this study it therefore seemed as the natural choice to collect data through qualitative interviews rather than quantitative ones.

A semi-structured approach to the interviews were taken with support from among others Bryman & Bell (2011), meaning that I had a list of topics that I wanted to discuss during the interview but no set order to ask the questions. This since I wanted to be able to pick up on things discussed by the interviewee during the interview, in line with a semi structured interview.

My ambition during the interviews was to do the interaction in the same way as Burns (2000) explains that he tries to interact with the respondents during the interview;

> *"The interviews are semi-structured in that the issues to be explored in general is agreed by the researchers prior to the visit, but the interviewees are constantly encouraged to do all the talking"*

Kylén (2004) argues that in order for an interviewee to really understand the respondents feelings or thoughts the interviews should be held live in person. Weinberg and Gould (2007), argues in the same way and argue that face to face interviews are the most desirable form of communication due to that a large part of the communication between two persons are done with more than just words. Therefore Weinberg and Gould (2007) continues, it is possible to dig deeper into the respondents answers when both parts can see, and clearly feel, the tone of the conversation. In that way the interview becomes a trustworthy conversation between the two parties instead of a questioning, something they consider to be positive to the validity and reliability of the answers.

With support of the above the researcher decided that the data collection would be conducted through interviews in a semi-structured way, face to face with the respondents, where the researcher tried to encourage the respondents to do as much of the talking as possible.

2.2.5. Data analysis

In line with what Bryman & Bell (2011) express the interviews generated a large amount of data. Bryman & Bell (2011) further explains different ways to mange this data into data that can be used in the analysis. One of these ways is presented as coding of the data. The concept is explained as that the data is broken down into segments shortly after the collection of the same.

Another approach presented by Bryman & Bell (2011) is called thematic analysis, meaning that the researcher searches for themes in the data collected and then structure the findings from that.

With these two approaches in mind I decided to analyse the data as described in section 2.1.3. The data from each respondent was codified into types of challenges and themes from all the codified interviews where then searched for, in order to identify the perceived key challenges of external patent exploitation.

2.3. Validity and reliability of the study

Bryman & Bell (2011) argues that validity and reliably are two of the most important aspects to consider when evaluating business research.

2.3.1. Validity

When evaluating the validity, Kylén (2004) argues, the researcher investigates the usefulness of the data. This could relate to different kinds of validity, the four most commonly discussed are according to Bryman & Bell (2011), measurement validity, internal validity, external validity and ecological validity. Bryman & Bell (2011) discuss further that in relation to qualitative research the external validity is the one most commonly discussed, potentially also in relation to internal validity.

Internal validity

Relates to the relationship between the variables of the research (Bryman & Bell, 2011). In this study the internal validity relates to wheatear actually these potential challenges really hinder outbound open innovation. In my opinion the internal validity is relatively good due to that the respondents, that are the ones with the deepest knowledge of the area, were allowed to elaborate freely in the interviews due to the semi structured setting where they did as much of the talking as possible. I would argue that this leads to that they discuss the areas they consider being the most impactful and hence having the highest internal validity in relation to the research question.

External validity

Relates to the question whether the findings of the study can be generalised outside of the area of study (Bryman & Bell, 2011). I would argue, in line with Bryman & Bell (2011), that the external validity is a challenge in relation to a qualitative case study. In order to raise the external validity a larger sample of cases would need to be investigated but this was not possible in the scope of the study, both due to time and financial limitations of the study.

2.3.2. Reliability

Relates to accuracy of the data which often is explained as to what extent the study can be replicated or repeated with the same results (Bryman & Bell, 2011). This is a requirement that is hard to meet in relation to study with the object not being a brute fact and when the data is collected through the interpretation of the interviews. Bryman & Bell (2011) argues accordingly that reliability is a particular issue in relation to a quantitative research design not a qualitative.

Kylén (2004) discuss this further and argue that different data can be true to different people when the study focuses on non-brute facts and when data is collected through interpretations of interviews. Still, he continues, the reliability could be strengthening through a larger sample of data collection, which proves that the results are somewhat repeatable.

As discussed above it is hard to argue that the study holds a high reliability due to the nature of the study, a higher reliability could perhaps be received through a large sample of cases including more interviews, but this was not possible in the scope of the study, both due to time and financial limitations of the study.

2.3.3. Other approaches to evaluate research

As seen above Bryman & Bell (2011) among others argue that validity and reliability not always are the best way to evaluate qualitative research. This has lead to that some writhers according to Bryman & Bell (2011), have developed conspectus that better should be applicable to the evaluation of qualitative research designs. Bryman & Bell (2011) present an example that evaluates the research on four different kinds of trustworthiness;

- Creditability – how believable are the findings? (Internal validity)
- Transferability – can the findings be applied to other contexts? (External validity)
- Dependability – are the findings applicable at other times? (Reliability)
- Conformability – to what extent has the researcher allowed his values to affect the research? (Objectivity)

In relation to this study I would argue that the creditability is significant. The results from the interviews are relatively homogenous and the findings are relatively coherent with what is written about the field from a more top down perspective in prior research. Regarding the transferability I can only speculate that so would be the case but in order to know a larger study has to be made, the same conclusion is made in relation to dependability. Regarding the conformability I am a ware that since I interpret and take part in the interviews I cannot be seen as objective towards the research. On the other hand from the epistemological and ontological standpoint present above that objectiveness would not be wished for due to the nature of the research.

3. Literature review/*theoretical framework,*

Section 3 Literature review/theoretical framework, will present previous literature within the field of external patent exploitation. Section 3.1 – 3.3 will discuss the rise of knowledge economy, intangible assets and Intellectual property rights. Section 3.4 – 3.7 will deal with exploitation of patents, outbound open innovation and the identified success factors and challenges regarding the same.

3.1. The Knowledge Economy and the Knowledge Worker

Drucker (1993) highlights that the western society during the last 600-700 years has moved through 4 major economical shifts in terms how the society, from an economical point of view, has been constructed. Without going deeper in to the earlier phases here, Drucker (1993) argues that we now are in the transition of moving to what he calls the post-capitalistic society, a knowledge based economy. The major difference of the knowledge economy, compared to prior eras, is that previously land labour and capital were seen as the factors for economical production and growth. In the knowledge economy it is knowledge that will be the primary factor for generating output. (Drucker, 1993)

A major difference between the knowledge economy and the previous economical stages will then be how we look at and value the workers. Traditionally workers has been valued from a perspective that a worker can do X amount of work in X amount of hours. What were needed were the man-hours, one worker could be switched to another and the same work would have been done. Drucker (1993) compare this traditional worker with the worker in the knowledge economy, the knowledge worker. A knowledge worker is not directly tradable for another worker because the knowledge worker creates value through the knowledge he possesses. That knowledge and ability to use knowledge differs from person to person, hence the workers will no longer be changeable to one and other. Since it now is the knowledge and not the hours that the worker can put in to the firm that determine its success Drucker (1993) argues that knowledge will be the primary factor for generating economic growth or value for a company in the knowledge economy.

Petrusson & Heiden (2008) argue that the transition into a knowledge based economy and an emergence of what they refers to as knowledge based business will mean a fundamental shift in the way that all knowledge based business will become global actors. Since it is knowledge that is the transacted goods there will be no physical boundaries. Petrusson and Heiden (2008) continues that firms will need to focus on managing intellectual property rights since these are the foundation for trading with knowledge. In the same manner Davis & Harrison (2001) states that it is from these assets (intellectual property rights) that we can develop sustainable future cash flows in a knowledge-based economy.

Petrusson & Heiden (2008) exemplify this transition through the example of the farming industry. They state:

> *"It was not that long ago that over 90% of the population of the world was engaged in farming, where productivity was constrained by the limits of physical labour, and value creation was based exclusively on the sale of crops. With the advent of*

> *industrialization, overall productivity increased substantially through the introduction of chemicals and machinery into the value chain, whereby a major portion of the value added was appropriated by the industrialist in relation to the farmers. Today we see the creation and extraction of value even further upstream in the value chain, where companies such as Monsanto own the differentiating genes of valuable crops and thereby control their development and distribution."*

It is no longer the ones who are harvesting the corps or the ones who managed to make farming more efficient through the introduction of for example machinery that harvest the largest part of the profits, it is the ones that possess the knowledge on how to do so that do. (Petrusson & Heiden, 2008)

3.2. Intangible versus tangible assets

Kenan (2013) argues that tangible assets today starts to become a commodity that is only needed in order to bring intangible assets to the market. Tangible assets are only a mean to an end for a firm with a knowledge-based business model, it is the leveraging of the intangible assets that holds the greatest opportunity.

Gassmann (2006) continues in the same way and argue that in order to stay competitive in today's market it has become more important to own and control intangible assets through intellectual property, then what it is to own the factories.

Kline (2003) argues that as we transition further towards the knowledge economy the value of the corporations that consist of some sort of intangible assets has grown, not only to hold a significant part of the market value, but to be a major part of the firms market value. He shows this by claiming that 50 and 70% of the total market value of all public companies in the US is made of some sort of intangible assets.

Building on that, Kenan (2013) argue that as of today the total investments in intangible assets such as R&D, education of work force and IP management is bigger than the ones in tangible assets such as equipment or machines. This will mean that the value of intangible assets will further rise in relation to the tangible ones, Kenan (2013) argues.

Information or knowledge within an organisation can exist in different forms. Chesbrough (1996) among others discuss two types of such knowledge, Codified and tactic. Codified knowledge is the information that in someway is made more accessible in the way that for example a manual is codifying the knowledge of how to operate a machine. The tactic knowledge on the other hand is the knowledge or information that is only in the head of the worker, for example the knowledge a sales person holds on how to best approach a client. The tactic knowledge could be codified if the sales person in this case were to describe that in some form that would be possible for other to understand even if the sales person would leave the firm. (Chesbrough, 1996)

Chesbrough (1996) further argue that codified knowledge, opposite to pure tactic knowledge is possible to transact such as a good or product, since it even to its intangible form has been made more tangible and it is possible for an outside actor to read the code and obtain the knowledge.

A basic example of such a case is the codification of knowledge by the writer of a textbook, the writers codifies their knowledge so that for example the university student can absorb the knowledge that prior to the text book were only tactic. Codifications of knowledge have in this way enable a transaction without the need for the writer and the reader to meet in person, hence knowledge can be transacted faster and more effective due to that it is codified.

In order to obtain intellectual property rights the knowledge that will be protected has to be codified often in written form or in forma picture/drawing. An example of this codification, as seen below in the example of the patent, is the description of the invention and the drafting of claims. (Levin, 2011)

3.3. Intellectual property rights

In order to protect these intangible assets so that the firm can demand an exchange for the spreading of the same, there exist different intellectual property laws that will protect the owner of intangible assets. What sort of intangible asset the different laws protect and in what way this protection exists, is different in order to meet the needs of different situation and assets. What unites the intellectual property laws is the overall idea that these laws will protect and grant the owner exclusive rights to the intangible asset by granting the owner intellectual property rights. (Levin, 2011)

The reason why the intellectual property laws exists is that they are a key component in the system that incentives investments in the activities where the valuable outcome is mainly intangible such as R&D. As an example the patent grants the holder the right of exclusivity for 20 years from the date of filing in exchange for that the content of what is protected is made publicly available. (Levin, 2011)

There are four major types of intellectual property rights in Sweden and Europe, the patent, the trademark right, copyright, and design right. Sometimes trade secrets are added to the list since they in most jurisdictions possesses a certain level of protection if treated correctly. (Levin, 2011)

3.3.1. Patents

A patent protects the technical function of a product, method or application for a term of 20 years from the application date. The protection gives the owner of the patent the right, for the period of when the patent is valid, to exclude other actors, within the region where the patent is granted, from producing, selling, import etc. The right is to bee seen as any other right that is transferable and it is therefore possible to license, sell or otherwise exploit the patent outside of the firms' boundaries. Further the patent is national, meaning that the right only is granted in a jurisdiction where a patent application has been granted. (Levin, 2011)

In order to obtain a patent an application has to be handed in to the national patent office, the application should consist a description of the invention, potential drawings to explain and visualize the invention as well as a claim of what is claimed to be the invention. The patent should be disclosed so that a person with an ordinary skill in the art should be able to make use of the claimed invention. Further 3 main criteria's has to be fulfilled:

i. Novelty – what is claimed in the patent has to be original, not only in the country where it is filed but also in the entire world. This means that what is claimed could not be publicly accessibly or published prior to the application.
ii. Non-obviousness – what is claimed cannot be just an obvious step from what prior to the filing was known to the person ordinary skilled in the art.
iii. Usefulness or industrial use – what is claimed has to have some sort of reproducible function and usage, hence the result of applying the invention has to be the same every time. (Levin, 2011)

After the first filing the inventor or whom acts on his behalf generally have 12 months to file in other jurisdictions and still claim the priority date from the first filing. If the criteria's above are fulfilled a patent could be granted which usually takes about three years from the date of application. (Levin 2011)

3.3.2. Trademarks

The trademark right regulates the right to use symbols or words that are used to identify service or goods. The right can be obtained either through registration or through commercial use. There is no time limit for how long the trademark can be protected as long as it is used commercially at the market. (Levin, 2011)

3.3.3. Copyright

Copyright protects artistic works such as movies, music, and books, but also works such manuals, databases or software code. Copyright is obtained upon creation but the work has to be original in order to obtain the right. Copyright grants the owner the right to exclude others from copy, reproduce distribute or commercially exploit the work, in Sweden the right lasts for 70 years after the death of the creator. (Levin, 2011)

3.3.4. Design rights

Design rights or design patents as it is called in some jurisdiction such as the US, protects the visual non-functional aspects of the product. The right originates from the right to protect certain designs on for example textiles from infringement.

In Europe a more narrow protection of 2 years is obtained upon creation. In order obtain full right the design has to be original and distinguishable then protection can be obtained for five periods of five years meaning a maximum protection time of 25 years in Sweden and Europe. (Levin, 2011)

3.3.4. Trade secrets

Know-how that is particular and essential to the firm such as lists with clients could be considered as trade secrets. Such assets could be considered to posses an intellectual property right if managed correctly meaning that the company does what it can to protect them. In such a case the company could have the right to damages if the trade secret is leaked and the person who leaks could be charged with crime and prisoned. ((Lag (1990:409) Law about trade secrets)

3.4. Exploitation of patents

In order to leverage and thereby gain any profit from the process of getting the patent granted the patent has to be used in some way. If the patent only lies on the shelf and no action is taken on the patent, the patent will only be a cost for the holder.

If the holder wants to make use of the patent they can either do so internally or externally depending on what they want to accomplish with the usage. Harrison & Davis (2001)

3.4.1. Internal Patent exploitation - a defensive strategy

Harrison & Davis (2001) argues that a company are at different stages when it comes to managing their IP. The first level they identify is the defensive level, meaning that companies are aware of that intellectual property can be an important asset of competitive advantage but uses it solely to defend their business.

Traditionally this has shown through an internal defensive exploitation that has been accomplished through exclusion of actors from the market or from reactive taxation through royalties, for their participation at the market. (Monk, 2009)

The holder of the patent secures in this way exclusivity for the product, an exclusivity that hopefully will give the holder a competitive advantage over their competitors during the term of the patent. (Harrison & Davis, 2001)

3.4.2. External Patent exploitation – a direct profit seeking strategy

Harrison & Davis (2001) develops their theory further and argues that there is a more developed way of mange the firm's intellectual property and patents in seeing them as a business tool rather than just a legal right to block others. Harrison & Davis (2001) argue that this can occur in more than one of their described management levels, but the common ground for the profit-seeking firm is that they search outside of the firms boundaries for new opportunities to exploit their patents.

In the same way Rivette and Kline (2000) Chesbrough (2003a, 2003b) Kline (2003) argues that the company should look beyond just the defensive actions in order to really leverage their patents. If these actions are to gain real leverage it requires the companies to in some way share their intellectual property outside of the firms' boarders.

3.4.2.1 Different types of external patent exploitation

Ziegler et al (2011) discuss 6 different ways to externally exploit patents:

i. **Licensing**
   Licensing-out patents is the most common way to conduct external patent exploitation. It is generally defined as that the licensor allows one or several actors to use a patent protected technology or product. In return the licensee pays the licensor a (monetary) compensation. In this way the licensor keeps the ownership of the technology but are able to monetize the patent outside of the firm boundaries. (Ziegler et al, 2011)

Further Ziegler et al (2011) argues that out-licensing of patents can be done in several different ways, below three major points that differentiate how the out-licensing is constructed:

- **Exclusivity or not**
  If the out-licensing is exclusive, it means that the holder will only grant one actor the right to exploit the patent. Often such exclusivity of an out licensed patent is given in relation to a specific industry, market or region, giving the licensee exclusivity in their market but the licensor still have the opportunity to license the patent to someone outside of that market, region or industry. Exclusivity could also be given in its most extreme form where the licensee gains absolute exclusivity as if they owned the patent meaning that not even the licensor is allowed to use the patent. (Ziegler et al, 2011)

  Non-exclusive licenses on the other hand only grant the licensor the right to use the technology but it does not grant them exclusivity since the same license is or could be granted to several actors regardless of in what industry, market or region they are active (Ziegler et al, 2011).

  An example of a non-exclusive license is an industry standard, where everybody has the possibility to use the standard after taking a license from the licensor.

- **Content of the transaction – with or without knowledge transfer**
  The license could consist of solely the patent as a legal right to use what is patented. If so, no extra knowledge or know-how around the invention is transferred to the licensee. Such a licensee is therefore seen as a transaction without knowledge transfer. In this case the out-licensing is more of an administrative process that grants a right, not knowledge. (Ziegler et al, 2011)

  In some cases the licensee would better benefit from the license if knowledge around the patent also were transferred as a part of the deal. Examples of such know-how or knowledge could be research reports on how the invention best is used, market or competitor reports, any made prototypes or simply knowledge on how to best set up and operate a machine. These types of licenses are more than just a signing of legal rights and often require a more strategic involvement from several unites within the licensees firm to complete in the transaction. (Ziegler et al, 2011)

- **Carrot or stick-licensing**
  If the external exploitation is focused on taking action towards actors that potentially are infringing the patent, we are referring to stick licensing. The licence is not spun from that the licensee or licensor sees an opportunity in that they licensee get access to the technology. Rather stick-licensing it is initiated from that someone without authorization is believed to be using what is patented. This type of licence often results in what above is described as transaction of the pure legal right and no transfer of know-how. This is since the infringing actors already most likely have invested in developing the technology themselves. (Ziegler et al, 2011)

What differs stick licensing as an external exploitation tool from internal exploitation is that in the case of the internal exploitation the goal of the action is to keep exclusivity, where as in the external case the goal is to make money from external use but through threat, not opportunity seeking. (Harrison & Davis, 2001)

Carrot or opportunity licensing on the other hand has its ground in that one of the actors shows an interest or opportunity in what is patented. It could be the case that the holder of the patent is searching for someone that is better suited to commercialize or develop what is patented. In a carrot licensing case the foundation is in that there is an opportunity whereas it in the stick is the case of a potential infringement. It is more likely that a carrot licensing includes a transfer of knowledge since both actors has a common interest in that the best usage of licensed patent is accomplished. (Ziegler et al, 2011)

ii. Cross licensing

What differentiate cross-licensing in relation to traditional licensing discussed above, is that both actors grant each other license of technology that they possess. It could still be so that one of the actors pays a royalty since what is cross-licensed does hold an equivalent value to both actors. The cross-licensing agreement is a common way for two actors to gain access to external knowledge from one and other without affective the cash flow negatively. (Ziegler et al, 2011)

iii. Selling

What differentiates the selling of a patent from an exclusive license is that the ownership of the patent is traded. If the company has no further interest of developing what is patented and does not use the patent as of today, selling might be more beneficial than licensing. This is because once the deal is done, no claim of right to royalty, new negation of terms or enforcement of the patents are needed. (Ziegler et al, 2011)

Monk (2009) argues in the same way that to be able to extract royalty there is always a threat of litigation in case the royalties are not paid and that is or could be very costly. By selling the patent, the holder gets paid up front and future risks or costs with the patent is avoided.

If on the other hand a company is or potentially might be using the patent themselves, or se a potential to license to more than one actor, out-licensing in some form might be more beneficial. (Ziegler et al, 2011)

iv. Strategic alliance

Refers to the alliance with an outside actor of either the commercialization or more likely further development of what is patented. Alliances between companies and research institutes such as universities are a common strategic alliance used by many companies in a development phase. In contrast to a joint venture the actors do not share assets directly and are still operating as different legal entities. The strategic alliance is a just coloration around the patent or technology. (Ziegler et al, 2011)

v. **Spin-off**
Another way to exploit a patent can be to create a spin-of that is responsible for the further development or commercialization of the patent. The spin-of could be a private entity, owned by the original holder or jointly with other actors, but the spin-of will operate as a separate entity. This could be a way of exploit patents that the holder has an interest in but the interest lays outside of the holder's core actives or does not fit in the current portfolio. (Ziegler et al, 2011)

vi. **Joint venture**
In a joint venture, a new legal entity is formed, an entity that is jointly owned by at least two actors. In a joint venture both actors share the risks and reward. In this way the founding companies can complete their technologies or patents in order to develop the technology or patent further. By creating a joint venture it could be possible for two actors together to enter a market, which neither of them could have entered alone. (Ziegler et al, 2011)

3.5. Open Innovation

Historically companies created everything they needed themselves in order to outcompete rivals on the market. The successful firm would develop, manufacture, market and sell their innovations. Chesbrough (2003b) describes this as if companies acted in the way that if you are to do something right you have to do it yourself. This meant that companies applied what he calls a closed innovation model or what Harrison & Davis (2003) refer to as the black box innovation model.

Chesbrough (2003b) further argue that for a long time this approach became self-evident as the best way. This was because the fact that, firms that invested most heavily in R&D and hired the best people would most likely come up with the best technology due to these heavy R&D investments. In this era the first mover advantage would also benefit the one who entered the market first with the best "new" solution and the company with the heaviest R&D budget would therefore reap the most profits from the markets. These profits could then be put back into the organisation to further develop the closed R&D function giving a further advantage.

There is no doubt, according to Chesbrough (2003b), that his model has been successful during the best time of the 20th century and that many great inventions and companies during that time has spun from this model. But Chesbrough argue just as so many others (Harrison & Davis, 2001, Rivette & Kline, 2000, Drucker, 1993) that something has changed.

In the same way as Rivette & Kline (2000) suggest that the change has come from our transition towards a knowledge economy Chesbrough (2003b) suggests that one factor that has changed is the rise, in numbers of knowledge workers and the mobility of the same force. According Chesbrough (2003b) this means that companies will have a harder to time to control their ideas and expertise, hence keeping control of the closed R&D model.

Chesbrough (2003b) also suggest that private venture capital that helps financing new firms that focuses on commercialization of ideas outside of the in-house research labs or even financing

commercialization of what is left when the biggest actors have grabbed what they are interested in.

Chesbrough (2003b) argue that such factors have broken the view that the closed innovation model is the only true way of gaining competitive advantage. He argue that these changes towards a knowledge economy has lead companies to adopt a more open innovation model where ideas and innovations not only are generated or used inside the firm, rather all opportunities are considered even if they are outside of the firm.

Gassmann (2006) even claims that the do it yourself mentality is out-dated when it comes to technology and R&D management and that this shows in that companies tend to open up their boundaries and try to access knowledge externally in search for new and radical innovation has been growing fast and have become increasingly relevant.

3.5.1. Inbound Open Innovation

Chesbrough (2003a) further describes this shift towards a more open innovation. He argues that competitive advantage for a firm no longer solely comes from the ability to do everything in house.

Rather competitive advantages today derive from the ability to perform what he refers to inbound or outbound open innovation. Chesbrough (2003a) describe inbound innovation as the practices of leveraging R&D or discoveries done outside of the firm. He argues that companies should use all potential R&D that exist and not only relay on that the research done in house is the most efficient and best one.

According to Chesbrough and Crowther (2006) there are different reasons why companies look outside of their own R&D for new technology. The two most common ones are the search for a predefined technical solution just like industrial product companies often source for the best components in order to reach the market faster and cheaper compared to developing it in house.

The other common reason is that firms search outside their core for technologies that would defend or even extend their core business. By doing so Chesbrough and Crowther (2006) argue the company lowers their risk for investing heavily in R&D in a technology that has not been proven yet. By gaining access to the technology outside of the own firm the company can instead focus on developing and tuning the technology to their own need.

3.5.2. Outbound Open Innovation

Adding to inbound open innovation Chesbrough (2003a) also describe the concept of outbound open innovation. He argues that companies should not only relay on that, they themselves have the best opportunity to bring the product or technology to the market. Rather companies should look outside of the firm for actors with a better-suited business model for bringing the technology or a part of it to the market.

In the same manner Kline (2003) argues that the benefits of doing so are not only financial but could have a large strategic impact on the firm. One example he refers is a case where a

previously proprietary technology had the potential to become a standard, and in that way the position of the firm on the market will be strengthen.

In this way outbound open innovation could be one way the externally exploit patents but both Kline (2003) and (2003b) argues that Open innovation initiatives should not replace the traditional way of defending or enforcing ones intellectual property neither should it replace in-house R&D since the skills that comes with such an activity most likely are needed to know what technology the firm could leverage internally or externally. The opening up to a more open model should rather be seen as an opportunity to be more efficient regarding R&D and an efficient way of finding new revenue streams as well as new strategic opportunities for the firm outside of its boundaries.

Chesbrough and Crowther (2006) highlights that even though it seems to be so that inbound open innovation is spreading, the same proof is not to be found that outbound open innovation or external patent exploitation in a non-forcing way is. Gassmann (2006) states the same thing and argue that inbound open innovation is far more spread then outbound open innovation or non-coercive patent exploitation.

But Chesbrough and Crowther (2006) argue further that since there are proofs that inbound open innovation is used there got to be someone on the other side selling, licensing out etc. but still there are no empirical proofs of that. A potential explanation presented by Chesbrough and Crowther (2006) is that there exist organisations such as for example universities that are close to donors of technology and research, in the same time as they hardly bring in any outside technology to develop products or services.

There might also be environmental challenges in certain companies/industries that hinders outbound innovation or at least makes it harder to accept by mangers compared to inbound. But they do not move any deeper into what those challenges that organisations need to overcome in order to conduct in outbound open innovation activates. (Chesbrough and Crowther, 2006)

3.6. Identified Key success factors for external patent exploitation/outbound open innovation

Key success factors presented in previous literature are in many cases, even if labelled as a success factors, described as a challenge that the firm need to overcome in order to be successful. A list of the success factors are shortly presented below and a deeper investigation of what previous literature consider to be the challenges around these are presented in section 3.7

3.6.1. List of identified key success factors

Ziegler (2011), (2013) Rivette & Kline (2000) and Davis & Harrison (2001) among others, identifies based on pervious literature, several key success factors in relation to external patent exploitation. Below these findings are merged into a list of identified key success factors.

i. The strategy of external patent exploitation needs to be aligned with and included in the overall business strategy.
ii. Units that are fully dedicated to external patent exploitation enable success. In that way knowledge can be built and kept, needs for certain projects can be identified and

allocated to such a unit when needed, enabling a dynamic yet stable organisational structure.

iii. Full and active support from senior management has shown to be an important factor for success. It has shown that it is not enough that the strategy is there the strategy needs to be actively supported.

iv. Having clear goals and purposes of the exploitation has shown to be a crucial factor in overcoming the challenge of for example identifying what technologies to focus on.

v. The choice of partner firm should reflect the overall strategy as well as the goal of the external exploitation. It is the partner firm that will bring the product to the market, hence they need to be able to do so in a successful way in line with our strategy.

vi. The better knowledge the firm has about the market or actor they are targeting, the better possibility the better the outcome of the exploitation tends to be. This means that a success factor is the capability within the firm to track, map and analyse the need for and potential use for internal technology outside of the firm.

vii. The culture of the firm needs to be open towards external exploitation. For example Davis & Harrison (2001) argues that it does not matter if the strategy claims that patents should be externally exploited if the culture of the firm does not support that strategy. The culture takes more time to change than the strategy but once it is there, the culture will help leverage the strategy.

3.7. Major challenges that hinders external patent exploitation/outbound open innovation

Previous literature has identified several challenges that firms need to overcome in order to be successful or in order to even conduct some sort of external patent exploitation in a non-coercive way.

3.7.1. The challenge with the treatment of intellectual property as a defensive tool at the legal department

Kline (2003) Kenan (2013) etc. argues that one reason why intellectual property often has been seen as something we should protect and not share is that it is the corporate legal department that has been responsible for the intellectual property management. Kline (2003) continue that the corporate legal departments mission was to protect the technology not leveraging it, meaning that the intellectual properties naturally has become and has been seen as a legal defensive tool.

Monk (2009) explains:

> "*Business people are worried about probabilities, while lawyers are worried about possibilities. So lawyers would view selling 50% of a firm's patents as dangerous, while a business manger might see this as an opportunity to monetize certain non-performing assets and focus on others that are more valuable.*"

Today this view hinders external exploitation since even if business managers at different firms and divisions are starting to se intellectual properties such as patents as important strategic assets, they need to overcome the tradition of a defensive strategy (Kline, 2003). It is solely not enough to convince top executives or important stakeholders within the firm that the intellectual property can be highly profitable if leveraged outside of the firm. You will also need

to prove that such an opportunity compensates potential decrease of operating profits and that the defensive strategy is not hurt. (Fosfuri, 2006)

3.7.2. The Strategic dilemma of licensing

In the light from that intellectual property traditionally has been seen as defensive tool within many organisations, Fosfuri (2006), argues that a strong position on the market or a business model where a major part of the revenue for the firm derives from offering of products or services, could be a challenges in relation to external patent or technology exploitation.

When a firm does not have access to sufficient downstream activities such as manufacturing, distribution or marketing activities, external exploitation is one of few means the firm have to get an appropriate return from their innovation and technology. This will mean that there in such a company would be no strategic dilemma whether or not the firm should externally exploit their intellectual property. But if a firm holds a stake in any way further down the physical value chain, there might be a dilemma if they are to for example license the patents outside of the firm. (Fosfuri, 2006)

An example of actors that normally does not hold a stake downstream, are research institutes and universities. On the other hand the typical industrial firm is a clear example of an actor with a business model based on offering products or services to the market. The R&D they perform are typically to support that particular business model, meaning that they often have a defensive approach to intellectual property. (Fosfuri, 2006)

Fosfuri (2006) argue that a dilemma exist since an operating company has a revenue stream from selling products to the market that they are not willing to sacrifice. As seen above many firms consider their intellectual property as a way to defend these revenue streams. Since an external exploitation of a patent or technology will mean that others will gain access to what previously was defended there is a risk that the licensors market shares and/or profits will decline. This could be due to that for example a price premium no longer is possible since others have access to the patent or simply that there now are other acceptable alternative for a buyer on the market. (Fosfuri, 2006)

Fosfuri, (2006) further argue that licensing of technology and especially patents is a fairly new phenomenon in many industries. This could mean that there is a hesitance towards such activates since firms and management in such industries do not have the knowledge of what is needed to enable successful out-licensing, neither do they possesses the historical proof of that the strategy is successful.

Therefore it is even more crucial that the intellectual property managers are able to show that royalties, or other positive effects such as strategic benefits, from licensing balance the potentially lower price or higher cost as well as the potentially reduced market share the licensor might meet as an effect of opening up the exclusivity granted in form of a patent. (Fosfuri, 2006)

This dilemma has the effect that operating companies often are a bit reluctant towards out-licensing. This shows in that the most reported reason for why operating companies do not out license more technology, even if there are actors that are willing to license, is that they fear for

increased competition on their own market. This leads to that most licensing today is targeted towards markets or regions that could not be reached directly for the licensor. Meaning that even if firms starts to open up towards an open outbound innovation strategy they tend to do so only towards markets where they have an existing stable or desirable position, neither now or in the future. (Fosfuri, 2006)

Another factor that affects the willingness to out license is the number of potential sources to the technology. Multiple potential sources for a technology tend to create an incentive for a potential licensor to actually license. The reasoning behind this is that with multiple sources a third party might eventually get their hands on the technology or even invent around it on their own. If this is the case, firms tend to argue that it is better to get license revenue then that somebody else does, or that the third party manage to invent around the patent. (Fosfuri, 2006)

3.7.3. External exploitation and valuation without a standardized market

Monk (2009) establishes that there exists some kind of market for innovations, technologies knowhow or intellectual property. He builds this arguments for the existence of a market on that many firms has reported significant growth of revenue and profits from for example external exploitation of patents in the last fifteen years.

Further Monk (2009) argues that the market is growing even though there exist no standardized market place to transact intellectual property or know-how at, as there does for listed stocks for example. There could be many reasons for why, but one of the most commonly used is that patents by its nature are individual and unique and differs in quality. This means that the value of patents is not determined dependent on the quantity of patents but the quality (Monk, 2009). The value of a patent could also differ in its value dependent on what other assets the buyer posses. This is because the value of the patent is determined by the surroundings, meaning the buyers capabilities. This creates a situation where standard valuation of a patent is not possible, both because of the patents uniqueness and the uniqueness of the buyer. (Kenan, 2013. Monk, 2011)

The fact that granted patents could be challenged in court, also makes the valuation harder since the capacities to defend the patent and the potential interest for a third party to invalid it will be a part of determining the value. This is just yet an example of why there, even though some has tried to create such, exists no accepted standardized metrics to value patents. The valuation of patents therefore has become something of an art rather than an established science. (Monk, 2009)

Adding to this, the actual transactions that are made are often kept secret. This makes it challenging for an actor to benchmark the potential value of their patents to previous transactions at the market in the way that is done for almost any other asset. Without the possibility to do such an estimation it could be hard for a company to move on and exploit the patents since the only value they can determine are the potential losses. In that way the absence of a standardized market restrain the exploitation of patents outside of the firms boundaries' for many companies (Monk, 2009).

Ziegler (2013) adds to this when establishing that, to valuate the patents that are to be externally exploited in way so that that both parties close a deal is one of the hardest challenges

that the licensor or seller of the patent needs to overcome to close the deal. There is no market to look at so the party simply need to make an educated guess, often based on previous deals they have done.

3.7.4. The view of IP as a standalone asset

The intellectual property of the firm constitutes only a portion of a company's total intangible asset. The patents are often spun out or research and most likely there are a significant amount of know-how associated to, but not included in the patent (Kenan, 2013). Since the capabilities of the user is important in relation how valuable the patent is considered, as seen above, the patent is most likely more valuable for a licensee together with the know-how associated with the product. If the licensee considers the patent more valuable in terms of that they get not only the right to use the patent but also the capability of doing, the price could be set at a higher level. (Kenan, 2013)

This creates a situation where the view of the patent as a stand-alone asset limits the holder of leveraging the patent to its fullest potential (Kenan, 2013). As seen above, patents have historically been seen as defensive tools protected within the legal department, meaning that patents and know-how has been used separately. This has according to Kenan (2013) made external exploitation more challenging and less successful.

Today there are many examples of companies with success stories from external exploitation of IP and this has caught the business mangers attention and interest. The result of that is that IP management are more and more moving away from legal departments and towards business development departments (Monk, 2009). But the patents might still be seen as a stand-alone asset only that the exploitation is more in focus than the defensive actions (Kenan, 2013).

3.7.5. Identifying what patents to externally exploit

Lichtenthaler (2007) identifies external patent/technology exploitation as process. He dived this process into five different steps, planning, intelligence, negotiation, realisation and control. He describe that the intelligence step as the part that most often is considered to hold the biggest challenge. This part of the process includes the identification of internal technologies that could hold a potential value if being externally exploited.

There are different reasons why the intelligence part is considered the toughest according to Lichtenthaler (2007), one of these are the imperfection of the technology markets, meaning that there are no clear standardised market where a buyer and a seller can meet or where demand of a certain technology can be visualized. Discussed is also the challenge of knowing what the patents and knowledge the firm actually posses or control.

Further Lichtenthaler (2007) highlight that there is a risk that the operational employees during the intelligence process are drowning in information. This because both internal and external mapping is needed in order to fulfil the requirements of knowing what technologies that could hold potential. It is not enough to know what the market need if we do not know what we control or the other way around.

In order not to be overwhelmed by all the information Lichtenthaler (2007) argues that it is of most importance to clearly set the scope during the search. This might be seen as a risk since

the search then I limited but Lichtenthaler (2007) argues further that such a limitation is needed to withdraw any value form the information. This is yet another example of why the intelligence part is considered the toughest to accomplish according to Lichtenthaler (2007).

3.7.6. Time consuming to evaluate an opportunity of external exploitation

Lichtenthaler (2005) highlights that the process of identifying internal technologies of potential, addressing the right market and the right actor are highly time consuming activates. Only in about 30% of the situations when contact is established with an external part a deal I closed. This time has to be allocated from another activity and paid for.

Ziegler (2013) describes the same phenomena and argues that only in 25% of the case when a firm identifies a potentially interesting patent to exploit externally a potential counterpart is found. Further in only 25% of the cases when a potential counterpart is found a deal is closed.

Lichtenthaler (2007) argues that such a process in it self hinders outbound open innovation since many companies are not willing to invest enough time and money for a project just to investigate if there are any potential values. Mangers then rather tend to spend money and time on activates having a nature where it is easier to calculate the potential return on investment prior to the moment where a significant amount of time and money are to be spent.

3.7.7. Cultural challenges

In many firms, Lichtenthaler (2004) argue, a challenge of initiating external patent exploitation is the cultural view of, that what we utilize should be invented here. Kline (2003) makes the same conclusion and argues that firms do not generally want to share what they have. Lichtenthaler (2004) argues that this is due to that they are afraid of losing what Kline (2003) defines as the corporate crown jewels, meaning the patents that are the foundation for stable revenue from for example sales of products.

Lichtenthaler (2004) describes this as a cultural syndrome he calls Only-Use-Here. Further he argues that this comes out of the traditional view of patents as a defensive tool but also from the lack of knowledge of the potential of external exploitation. Hoang & Rothaermel (2010) argue that experience within the field of external exploitation leads to a more positive view of the same. By gaining experience the firm can overcome a traditional defensive culture of better being safe than sorry mentality, and moving more to a culture that enables what Kline (2003) defines as sharing of the corporate crown jewels.

3.7.8. Organisational challenges

Lichtenthaler (2004) argues that there are an organisational challenge in that so many different functions needs to be involved in the process of external patent exploitation in a non-coercive way. He visualize this in the example of that only in the process of identifying what technologies that might hold potential for external exploitation staff from marketing, R&D, business and market intelligence, business development the exploitation team etc. needs to be involved. This creates a major challenge to the organisational structure enabling all these functions to interact.

One way of enabling and accomplishing interaction is by having what Ziegler (2013) describes as a dedicated function for external patent exploitation. This dedicated group can then reach out

and search for the competences needed within the organisation to successfully accomplish the mission.

Lichtenthaler (2004) discuss the technical knowhow of the managers as a possible challenge in relation to organisational structures. He concludes that it is not a problem that managers do not have the technical knowledge of the external exploitation per see. Rather the problem is that due to the better safe than sorry mentality mentioned above, managers want to be involved in the process through safeguarding what technologies that are exploited. When the managers do not have the technical knowledge of the technology there is a risk that they overestimate or underestimate the value of the technology meaning that the stage gate is not as effective as possible. This creates is a challenge in relation to how the organisation is set up so that the process of external exploitation can move on as smoothly as possible. (Lichtenthaler 2004)

Bianchi et al, (2011) argues that the challenge mentioned by Lichtenthaler (2004) above could exist purely due to that so many different managers and employees are and needs to be involved in the different steps, approving or disapproving of the external exploitation. It is not certain that the technical knowledge is even considered a problem rather the challenge of having everyone working towards the same agenda and goal could be a challenge enough that in the end often could restrain outbound open innovation.

3.7.9. Static and dynamic intellectual property rights

When discussing the intellectual property rights Petrusson (2004) argues that it is important to differentiate and understand the difference between static and dynamic intellectual property rights. Petrusson (2004) argues that the most discussed form and the form that most firms tend to focus on in their management and creation in intellectual property is the static right. This static right is described by Petrusson (2004) as the legal tool that can be used to invoke unauthorized usage of the patent through for example court injunctions. This means that the static rights should enable the user a freedom to use their invention without having someone else using the same.

Adding to this Petrusson (2004) discuss the dynamic right associated with intellectual property. He argues that it is through the dynamic rights that utilization of patents through more of just blocking others from usage is enabled. The dynamic rights are further defined as a set of tools that enable utilization of patents through different structural constructions meaning for example the tools utilized to enable a patent licensing deal. Petrusson (2004) argues that it is these dynamic rights that the entrepreneur or owner needs control in order to fully utilize the IPRs controlled. Still the so-called static right functions as a necessary precondition in order for the holder to claim a dynamic right, meaning that the static right enables the dynamic right. An example of this is that it is considered easier to license a technology if it is patented compared to if it is "just" know-how. The static right of blocking others from using the patent also enables the dynamic right of licensing the patent to a third party thereby granting them the right to use what is protected.

Petrusson (2004) further argues that even although laws and regulations in relation to static rights are fairly well developed, the regulations or standardisations in relation to dynamic rights are not developed to the same extent. This means, according to Petrusson (2004), that the holders of a IP will face a challenging environment in their effort to utilize their dynamic rights

through for example out-licensing a patent. The challenges include the difficulties in relation to that there does not exists sufficient accepted or standardized tools to use in order to set up an external exploitation, the difficulty of validating the legal structures of the deal and that these structures will be validated differently in different jurisdictions. Hence Petrusson (2004) argues that the patent holder will meet tough challenges but due to that the area is relatively young they also have the opportunity or maybe even a responsibility to develop these tools. The have this responsibility, Petrusson (2004) continues, due to that many of the legal tools that today are accepted in different jurisdictions exists as a result of that courts have accepted new tools or solutions designed by the users, hence the development has to continue in order for the dynamic tools to be accepted and therefore more accessible to use.

De Soto (2003) also discusses a similar phenomenon of turning a static right into a dynamic one when he discuss the possibility of turning property into capital. De Soto (2003) takes the example of person living in the west who owns a land property with a house built on it. The owner will have access to the house and have the possibility block others from having so. In that way the owner utilize the house in its simplest ways meaning he or she have roof over their head and a place to sleep. De Soto (2003) then argues that what differs the West from many developing countries is that the owner in the west can capitalise on the house through for example taking out a loan on the house. This loan can then be used to consume or invest in other products services that the owner could not consume prior to the loan. This is a way of utilizing a dynamic right, a right that is made possible because of the static one. In this case of the house it works because the bank can control and hence trust who owns the house and what value the property holds on the market, therefore the property is accepted as security for a mortgage, meaning that the property is turned into capital. If the bank cannot control who the rightful owner is, which is the case in many developing countries according to De Soto (2003) then the bank cannot grant the loan and the owner will not be able to leverage the property.

De Soto´s example of the house is a clear example of how we in the west through well-established tools have created a situation where it is possible to leverage the ownership of a house in a relatively effective and simple way because there exists established static as well as dynamic rights. The same is not, according to Petrusson (2004) the situation in relation to intellectual property rights such as for example patents. Therefore there exists challenges in for example out-licensing on more levels than just identifying who to license to, the challenges becomes tougher since there are no well established tools to leverage the IP other than through the static right of blocking others, just as there in many countries around the world due to structural challenges exists no clear or legal ways of taking out a loan on a house.

4. Empirical findings

After the analysis when the different respondents answers were coded as mentioned in the method section, and the grading of challenges were taken into account, three major challenges were identified. These three challenges are presented further in section 4.2 – 4.4. In section 4.5 other discussed challenges are addressed more briefly.

4.1. Recap of the object studied

The firm, in which a small function/unit has been studied, is a large multinational operating firm with more than 100 000 employees worldwide. Through their three main business divisions the firm serve both consumer and business markets within fields of everything from healthcare to consumer electronics. The firm is commonly known to be one the forefront of IP management and organisation and holds a tradition of rapid innovation and development within many areas. This study has been limited to one of these three divisions, namely the healthcare division.

The scope of the case was further limited to the unit responsible for external exploitation of IP in relation to this healthcare division. The competitive situation on the healthcare market is such that the firm have relatively few but big competitors. Also the client base is somewhat limited due to the limited numbers of healthcare institutions around the world. This means that the competitive market fairly tough and the view of IP is relatively traditional defensive, since the blocking effect often is what is used to achieve a competitive edge at the market. Still the studied unit actively work trying to identify opportunities to leverage their IP externally. Therefore the firm is seen as an appropriate object of study, they act on a market with a traditional defensive view on IP, they search for and are experienced with external exploitation and they are large enough to hold experience from many cases which is needed to get a broader picture. A smaller actor might only have experience from a few cases meaning that they challenges perceived more likely could be seen as coincidences.

The respondents were chosen with guidance from my supervisor at the firm in order to find respondents with knowledge and experience within the field of external exploitation. All of the respondents in the study have worked within the corporate IP organisation of the firm during the last 7-16 years. All of them hold substantial experience and knowledge regarding external patent exploitation and the challenges thereof from multiple projects mainly within the health care field but also in relation to other more consumers oriented technologies.

4.2. Identifying what patents to focus on in relation to external exploitation

In an operating company such as ours we have developed and patented an enormous amount of technologies during the years, one of the respondents explains. To know which one/ones of these that hold the best potential for external exploitation is definitely one of the biggest challenges we face in our effort to leverage patents outside of the firm.

All respondents identified the challenge of knowing what internal assets to focus on for external exploitation as one of or the biggest challenges in their work towards successful external exploitation.

When discussing this challenge, one has to understand, the respondents argue, that all or almost all of our controlled patents and technologies are developed for an internal use at one of the firms operating units of divisions. This gives us three different situations when it comes to determining what patents to focus on. A first scenario where the patent or technology has been used internally, one where it is used internally and one where the patent never has been utilized internally. These differences are important, they continue, because they visualise different challenges in relation to knowing what technologies to focus on.

i. The patent has been used internally but are no longer used

In such a situation we have the opportunity of knowing how the patent or technology was utilized internally. This gives us, one of the respondents continues, a situation where we can see what the technology can accomplish and then try to investigate what such a technical solution could enable for another actor or market.

In this case one challenge consist in understanding what of the technologies that we have abandoned that still could be interesting for an external actor. In this case we often have to turn to an external market since we probably abandoned the technology in favour of a more successful or cheaper solution and competitors at our market usually has to follow in order to stay competitive. The exception could be if we leave the market for another reason, then patents of value are usually licensed direct to that market but that is really an exception.

A third opportunity could be to target an actor within the same field as we have used the patent. Since we still are active in the field such and actor is often focused more on price than quality but still this is commonly not done since such an actor still might affect our operating business (see more in section 4.1.2 below).

To understand and identify what abandoned technologies that still could be of interest in another market is clearly a major challenge. We have understand what they need, convince them that they need it and that our technology is the best solution for them even though we have abandoned it in favour of something else our selves, one of the respondents adds.

ii. The Patent is still used internally

This often means that what is patented is in the forefront of the technology, and that the patent grants us a competitive position at the market. Since many large companies tend to investigate what other competitors or interesting companies are filing patents for it is not uncommon that other actors approach us and are interesting in licensing certain of our patents, a responder explains. In that way one might argue that it is an easier challenge to overcome knowing what to out license in this case compared to abandoned or unused technologies, but we still face the challenge of having to choose what to focus.

One of the respondents explain: in this case the challenge lays in that there generally are to many opportunities to harvest, meaning that we still have to evaluate which opportunities that are the best ones. This means that we in the end might decide which technology that will be used at a market where we have very limited knowledge. To mange these decisions in a relatively cost effective and hopefully correct way is definitely one of the largest challenges in relation to external patent exploitation, according to the respondents.

iii. The patent has never been utilised

This could be either an old or young patent but the invention has never ben utilized internally. We have historical examples from such examples that have been very successful but it is a big challenge to understand the potential value of such a patent, a respondent explain. Not only do we have to understand what the patented invention really enables, we also have to understand how that could be utilized for an external actor or at an external market. Hence we must learn about both external markets and actors parallel to the technology.

As seen these three scenarios means slightly different challenges on their own but the major challenge occur when we daily face all the three scenarios at the same time, the respondents explain. It would not be easy to know what to focus on if we only faced one of scenarios but then we could at least compare apples with apples. Now we are comparing opportunities where we do not have a stake at the market, were we do have a huge stake, completely new technologies that are unused at every market etc. How do we evaluate such different opportunities in a sufficient, cost effective and relatively correct way?

In the end, we often tend to act on the opportunities occurring when we are approached by external actors seeking for a technology that they know or hope that we have. That probably have a natural explanation because we then can, in an easier evaluate what opportunity the technology might hold because we know what market the actor want to use the patent in. Hence we can estimate the market size etc. more precisely one of the respondents explains. But still, he continues, we do not know what value the other patents we control might hold. How do we then know that we are focusing on the right deal, and more importantly how do we estimate the value we could bring to the firm through external exploitation of patents and technology? It also means that we do not choose what technologies we want to exploit externally, rather outside actor decide that by approaching us.

As you can see, one of the respondents explains, we have to understand in relation to which setting we have to understand the technology. That includes understanding in what way we are using it, how others could benefit from using it, meaning that we also have to understand their market and capabilities. From that we have to choose a very limited number of patents to move on with.

Worth mentioning is also that all of the respondents clamed that this challenge, as with many of the other mentioned in this study, are challenges that do not occur to the same extent when a company tries to monetize their patents only by going after infringers. But since so is not the case, the challenge of understanding what to move forward with, is seen as major challenge and potential restrain for outbound open innovation by the respondents. The opportunities are many with carrot licensing one of the respondents claim, but since they are hard to quantify it is more straight forwards and a natural first step to search for infringers and force royalties from them, hence external exploitation in a non-coercive way is hindered.

4.3. The dilemma of operating versus non-operating revenue

The challenge of working with external exploitation of patents and technologies in a firm that makes the largest part of the revenue from operating activates and have the main focus on offering products to the market, was heavily emphasised by all respondents.

Two of the respondents argue that since the firm's main goal is to develop technologies that can bring products to the market and return sufficient profits, we (the ones working with external exploitation of patents) often have to work with what is discarded by the operating divisions. Even so, when all internal division have discarded the technologies and the patents, every deal regarding out-licensing or sales of patent has to be approved by the business divisions.

This is done in part with the main goal is of protecting the profits from operating divisions but could lead to, for example, that a technology that was abandoned earlier suddenly becomes interesting to a division only because some external actor shows interest. Even though the operating division first abandoned the patented technology they are now afraid that they have missed something that an external actor sees potential in. This sort of situations and strategy has hindered many deals since the divisions feel that they want to evaluate the technology further.

One might argue that this, from our perspective, is an organisational problem another respondent explains, but from a bigger perspective it is the exact opposite. This process exists because they (top management) want to safeguard the division's revenue. A technology might mature and become highly useful for the division at the time of the external deal even if so was not the case when the operating units discarded the patent. But still, he adds, it hinders external exploitation in many cases.

One could also question, the respondent continues, if the operating units really should be so heavily protected in this way, because some of these external deals could enable large revenue streams from the entire market instead from only our direct sales of product. As of now our overall strategy is to harvest profits from our products, that could be questioned but that is another question but it could make the dilemma of protecting the operating units smaller.

Three of the respondents expressed that intellectual property traditionally has been and still is seen as a defensive tool. They argue that the defensive view makes it is so much easier for managers or executives to say no to a deal that could be successful in order to protect something that already is somewhat successful, than to say yes, have the opportunity but take the risk.

At our firm, one of the respondents explains, IP is not only seen as a part of the legal division, which often is stated the cause of why IP is seen as a defensive tool, but also as a business tool, yet the defensive view is still to large extent there.

The respondents explained further that even though the firm they work for have an established reputation of actually externally exploit their intellectual property, the main view within the firm is still that patents is a defensive tool used to block others from profitable markets. This is especially significant on markets where there are a few major players fighting for the market. Many researchers, the respondents adds, also takes great pride in being able to show that their

patent serves as the foundation for a certain product, but usually do not see the same pride or potentially even sees it as a failure if the patent is licensed or sold.

On the question if this view of intellectual property is stable or changing towards any direction they all think that slowly patents are starting to be seen more as an opportunity than just a defensive tool, but still defending the operating units is prioritized over external exploitation.

The dilemma of product or licensing revenues also limit the market that we could license to since the divisions do not want us to license to the markets were we have a strong product position. One respondent adds to this that he thinks that the environment actually might be opening up to licensing within the field. He explains that he recently managed to turn around a no to a yes from a division in a licensing case due to the argument that it was possible for the external actor to invent around or gain access to a similar solution from an other actor at the market. He then argued that it was better that they get the right to use our technology than a competitors since we then would make up some royalties even if we would lose some market shares, compared to if we lost the same market size and a competitor would make the royalties. The respondent then adds that he does not think that so had been possible only 5-10 years ago and argues that this is proof of that the view of IP is changing slowly towards a more open approach.

But still, he adds, the dilemma of product versus licensing revenue where we always have to convince operating units that we want to license a technology that is valuable to them is hard to overcome. This dilemma is definitely something according to all respondents that hinders external patent exploitation and outbound open innovation in our case.

4.4. Risk assessment for external exploitation

In order to get an approval to externally exploit patents or technology, a respondent explains, we have to estimate the potential value and risk of such exploitation. As discussed above the respondents argue that it is challenging to determine what technologies to exploit due to that it to a large extent is hard to determine what the potential use and value could be. The other side of that is to determine what the risk is. Even if the potential value of a deal holds a potential great value this has to be weight to the risks associated with the external exploitation.

To evaluate a risk is probably always challenging, one of the respondents argue, but to do so in relation to a potential carrot licensing deal is definitely one of the most challenging situations I can come to think of. As seen above we face different situations dependent on how the patents we are to license out are or have been used internally, another respondent continues. These scenarios also have to be considered when evaluating risks for potential out license projects. Dependent on how the patents are utilized internally different risk assessment has to be done. But overall the major challenge to overcome when determining risk seems to be to set a realistic scope of the risk assessment.

When initiating out-licensing deals how do one estimate risk in a realistic way for a patent that is used internally as well as out licensed within another field of use, a respondent ask himself? One might argue, he continues answering his own question, that the risk in such a situation includes that potential know-how associated with the deal end up in the wrong hands, that the

negotiating part tries to invalidate the patent or find devastating prior art that we did not know of, meaning that we will not only lose market shares at existing markets, we will also lose existing licensing revenue from other actors. As you probably understand we would never get a single deal approved when we have a hard time determining potential value of out technologies and patents in the same time when the worst case could be devastating for our operating divisions.

Two of the respondents argue that the challenge, of in a realistic way present the risks with the external exploitation is the single challenge that hinders most deals. They argue in the way that it does not matter what the potential value of the deal is when the opportunity is only seen just as an opportunity, by an operating manager in the same time as his existing operating revenue could be on stake. Most managers, at least at our firm, one of the respondents adds, rather make sure to firstly defend their existing revenue and then turn to opportunities to find new revenue streams. These revenue streams then preferably come from an opportunity not risking everything they already have built.

The challenge of presenting the risks in a realistic way without killing the deal is a challenge that is generally very hard to overcome, meaning that we often does not end up out-licensing our most profitable or potentially most profitable patents or technologies. We know that they hold a great value but since a patent could be invalidated or since the knowhow needed to utilizes the patent for a third party could end up in the wrong hands the deals are hindered internally in some way.

If we better could evaluate these risks or if the market was less uncertain in relation to the validity of patents we could probably exploit many more of our promising patents externally. Now we, and I know for a fact that many other operating companies do the same, tend to focus our licensing efforts into internally abandoned technologies or patents that cover promising technologies that not will be utilised internally due to that they fall outside of our core business, one of the respondents explain.

According to another respondent, it is actually amazing that the firm end up with a single deal that is spun out from a carrot-licensing situation when considering for example the challenge of showing risks in a good way. He further explained to me that he thought that the firm still holds hundreds of patents that could be utilized outside of the firm if there was an easier way to determine what the impact of such a deal could be and potentially also if the mentality of better safe than sorry was moved towards a more risk taking mentality. But in the end he adds, our job is to leverage patents without risking operating revenue, but sometimes we could maybe risk a bit more and make more, but that is a strategic questions way above my head.

Still the challenge of that everything is seen as a risk in relation to external exploitation hinders multiple deals that could have generated a large amount of royalties. Sure we are willing to take risk in the way that we spend time and money on investigating opportunities, a respondent explain, and that risk is easy to asses, the challenge comes in determining the risk when we have more than our time to lose, that is where the real challenge is, a challenge that hinders many deals of exploiting patents externally.

4.5. Other challenges discussed

Finding the right actor

This challenge is according to the respondents extremely important to overcome but is often solved if they truly manage to identify the right patents or technologies to focus their effort for external exploitation on. They argue in the way that in order to find the right area to focus on an analysis of potential actors is included, the market can never be the right one if there are no potential markets acting there. They further argue that they are somewhat limited to fewer actors compared to a non-operating company, since the operating company needs to consider the dilemma of losing market shares if licensing close to their own operating market.

Further the respondents speculate that the challenge of finding the right actor might be the biggest one for such a non-operating company but in their, as an operating company, the three challenges discussed above in 4.1-4.3 are hindering more deals and are hence bigger challenges to overcome.

The absence of markets

The challenge of that there is no standardised market for patents, making it hard to value and trade patents, were mentioned. The researcher followed up on this asking if they thought that a standardized market would solve the other challenges discussed above.

The answers were mainly maybe, adding that it is sort of a utopia to discuss such a standardised market and how that would affect our possibilities. If a standardized market such as the stock market existed for patents it would probably be of help, but since we are so far away from that it is more speculation than fact to say so, the respondents argued. Of course if a standardised market just popped up they would be thankful but they rather argued that such a market cannot exist until the challenges of estimating value and risk of a patent is solved not the other way around.

What know-how to include

Since carrot-licensing by its nature often include some sort of know-how transfer along with the right to use the patented invention, a challenge occur in determine what the firm is willing to include to the license in form of non-patented knowhow. It might be so I was told, that everybody agrees on that the patent as such can be licensed but everybody does not agree to what extent the know-how can be externally exploited. This has, according to the respondent, hindered deals in several occasions. This is a clear example of how carrot licensing often is so much more complicated than traditional stick licensing in the way that many complex challenges has to be solved, the respondent explained.

The unbalances in power and knowledge

The respondents argued that if there is any unbalance that hinders external exploitation it is generally knowledge unbalances. This is often visualised, the respondents explained, in that potential licensees on a market does not have the knowledge to truly utilize the technology in a successful way. It also shows in that the firms do not have sufficient knowledge or financial power to protect know-how transferred along with the patent, this is the case that most often hinders exploitation in relation to knowledge unbalances. We simply do not trust that they can handle our intangible assets in a trustworthy way, therefore a deal could be terminated, a respondent explain.

A respondent also adds that the differences in size could be challenging in some deals, it is always easier to deal with someone of the same size, then both actors play the same game with the same expectations. Adding to this, a respondent argue, there might of course be smaller actors that are unwilling to do business with big actors due to that they are afraid that we will steel their inventions, but when we are the licensor that is less common and hence not a major challenge to external exploitation, but noteworthy in relation to inbound open innovation.

Presenting know-how without giving it away

Know-how is often attached to a carrot-licensing deal as a part of enabling successful utilization of the technology. That creates a challenge in relation to presenting know-how, according to some of respondents. The challenge lies within that knowledge as such cannot be taken back ones it is presented. Often this is solved through only presenting what the technology enables and not the know-how itself, rather what it will include and enable. In some cases this is not sufficient to close the deal and then we have to relay on non-disclosure agreements but we prefer that not to be the case, a respondent explained. Partly because we hold no strong protection through such an agreement and partly because the resistance of signing an NDA due to that the other part then are risking that similar knowledge that they already posses in house could be presented by us, now as a part of the NDA.

To present know-how is a challenge but according to the respondents something that is possible to overcome if the other aspects of the potential deal is solved and agreed upon. Hence they did not consider this to be a main challenge that restrained external patent exploitation in the same way as the challenges in 4.1-4.3 above.

Organisational challenges

Some organisational challenges were mentioned but overall the respondents did not consider these challenges to be among the major challenges they need to solve in order to close for example an out-licensing deal.

The challenges that were mentioned were in relation that they needed approval from all the business units prior to externally exploit patents or that it sometimes is hard to get hold of researchers with knowledge in relation to patent with potential for external exploitation.

The respondents also added that their managers probably could point out several organisational challenges in relation to external patent exploitation but from their perspective the organisation was not a major factor for restrain of external exploitation, the organisational challenges they could think of was rather an affect from how they handled the other challenges mentioned above.

5. Discussion

In this chapter the findings presented in section 4 above will be discussed and related to previous theory Literature review/theoretical framework in section 3.

5.1. The challenge of determining what patents to externally exploit

This challenge has been highly emphasized by the respondents as a major hurdle to overcome in the process of external patent exploitation. This is also in line with what Lichtenthaler (2007) argues when he claim that this part of the process often is considered to be the hardest one. Lichtenthaler (2007) emphasize that the part is challenges since so many actions has to be taken at the same time. In the interviews conducted similar reasons to the challenge was highlighted.

Still this was not the main reason why the respondents highlighted this as one of the more significant challenges they met in their work. The reason for why they did so was rather that in the research for what patents that could hold potential, multiple scenarios in relation to how the patents are or could be used, has to be investigated. This put the respondents in a position where they felt that it was very hard to forecast what of the technologies they possessed that could hold potential.

Another aspect that made the identification of potential interesting patents or technologies challenging was that it is hard to keep track of what internal patents or assets a large operating firm posses. To then match these with what others in a potentially external market would consider useful and valuable created a situation according to the respondents that it was hard to get a picture of what to aim for.

Adding to this was also the fact that this identification of patents with potential for external exploitation is highly time-consuming, meaning that the operational employees could not evaluate all possibilities before moving on with one that seemed interesting. Also this aspect is discussed in literature, where for example Ziegler (2013) and Lichtenthaler (2005) argues that the process is highly time consuming, yet only a small percentage of the potential deals are closed.

The problem was by one of the respondents compared with the classical chicken and egg problem, how to know if to start internally to search for something interesting or to search the market for someone that might benefit from a patent that we know of. Either money is spent prior to that we have any knowledge about potential profits.

It is no surprise that this was considered one of the hardest challenges in the process of external exploitation since so also was presented in studied literature, what was interesting on was the fact that the respondents had not identified a clear way of overcoming the challenge. Still the employees had to make business cases for each and every patent and from that see if they hold potential. An outcome of this was that the employees more often rather acted on requests from external actors. This mean that they let external actors decided what they are to work on instead of finding a good way searching for what Kline (2003) refers to as the corporate crown jewels.

I would argue for the fact, that in many cases external actors choose what is to be externally exploited, puts the firm in a position where they no longer fully control their own strategy

regarding external patent exploitation. Sure they can control the process by limitations to what is exploited but that means that the firm are managing their business by restricting opportunities rather than focusing on creating them. In this way the firm end up riding in the backseat of the car that they were supposed to drive. In the long run, acting like this could mean that the firm will lack a proactive strategy in relation to external exploitation, rather they take a reactive strategy only controlling the process not steering it.

I therefore think that it is of utmost importance to structure the internal intangible assets in a way so that a better overview of what is owned in relation to internal use but in relation to what could hold a value for an external actor of some sort.

5.2. The dilemma of operating versus non-operating revenue

The challenge of working with external exploitation at an operating firm is as seen highlighted as one of the single challenges that affect everything in the process of external exploitation.

Neither this finding is surprising in since the challenge is discussed in literature Fosfuri (2006) argues accordingly that a strong market position affect the will to externally exploit patents. The challenge is also by the respondents considered to be one of the toughest to overcome in relation to initiate or close a deal for external exploitation.

One thing that was highlighted by the respondents that had not been discussed in previous literature was the time perspective in relation to having a stake at the market. According to the respondents it is not only in the cases where the firm has or are trying to establish a strong market presents that will be affected. Also technologies or patents that might be of interest in the future, depending on what path the overall strategy for the firm will take in the next 10-15 years, will matter. This means that the licensing dilemma that Fosfuri (2006) discus not only affect the firm directly but also based on potential interest in the future. Since most or almost all patents originally are developed for internal use they most likely hold some sort of potential use.

This shows that not only an existing stake at the market affect the will to out-license but also a potential future stake when the market or strategy possibly change in the future, matters. As understandable the respondents argues that it is almost impossible to argue against the argument of that we might move there in the future and then we do not want these patents to be used by someone else at that market prior to us. Hence the product focus is hindering a further development of external patent exploitation due to not only the existing strategic focus but also a future potential one.

It is almost as that the operational employees have to prove that the firm will not make a strategic turnaround that would make the patent needed within a new field at any of the internal operating entities. The same holds for that the employees almost have to show that this patent will not hold any potential for us in the future market, but how to show that, who would have guessed in 1999 what the market for mobile communication would look like in 10-15 years.

5.3. Risk assessment

The challenge of risk assessment in relation to external exploitation is not something that is highly discussed in previous literature. One reason for this could be that the risk assessment not directly hinders the external exploitation. The challenge rather serves as a major challenge to overcome in order to for example better overcome the challenge of the strategic dilemma between products and licensing revenue. Another explanation why so might be the case is that this challenge might not be visualised from a top management perspective since it is of a to detailed nature.

As seen above, the respondent argues that the risk assessment of external exploitation is something that highly is affecting all aspects of the process. I would argue that this challenge therefore is of major importance even if the challenge might not directly hinder external exploitation it will do so indirectly.

The risk assessment of potential value and risk serves as a foundation for many business decisions. In a situation where it is hard to estimate potential opportunities and when the main focus of the firm is somewhat in the opposite direction of external exploitation, which is the case within an operating company, this challenge becomes highly visible. Since the challenge serves as a base for many of other challenges I would argue that the challenge of risk assessment is a part of the process that to a large extent seems to hinder further external exploitation.

The challenge estimating risk is also related to the discussion Monk (2009) describes on how different actors within the firm views IP from different perspectives. This will also affect the perceived validity of the risk assessment since different actors will assess the estimated and presented risk from different angels. Generally the operational managers will be more unwilling to take risk in relation to “their” business meaning that it is even more important to have a good way to present and assess the risk in order to overcome for example the strategic dilemma of licensing versus operating revenue.

6. Conclusion

Chesbrough (2003a) Rivette & Kline (2000) Davis & Harrison (2001) etc. all argues that in order to stay competitive in the future, companies need to look beyond the borders of the firm for value creation opportunities regarding patents. Still, even if there is a slow movement towards a more open model, there exists a hesitation towards sharing the corporate crown jewels outside of the firm.

In this study challenges that hinders external patent exploitation has been studied at multinational firm with their main revenue and focus towards their operating units. This was done in order to answer the research question of:

> *From an operational perspective, what are the key perceived challenges for external patent exploitation /outbound open innovation, in a non-coercive way within an operating company?*

Three major challenges have been identified:

i. Identifying what patents to focus on in relation to external exploitation
ii. The dilemma of operating versus non-operating revenue
iii. Risk assessment for external exploitation

Noticed is that these challenges to a large extent are challenges in relation to internal factors. The challenge of risk estimation and the strategic dilemma both concerns to overall challenge of getting approval for external exploitation internally. The challenge of identifying internal assets that could hold potential value for external actors faces challenges in relation to both internal and external aspect.

I would have thought, prior to the study that organisational factors including knowing who to turn to within the organisation or too long lead-times for decisions or the challenge of identifying the right actor would be considered the largest challenges according to the respondents. I still think that these challenges occur but the findings in the study made me realise that those challenges are only one part of the external exploitation process. Potentially those challenges are what we find if studying a firm from a distance or from a top executive perspective.

The challenges identified in this study on the other hand, have the focus from an operational perspective. The findings presented above are the challenges they consider hinders them from accomplishing deals for external exploitation. I am not arguing that one of the factors are more important than the other, I would rather say that we need to see them in relation to each other. There could be millions of best practise of how to organise a firm but if we do not solve the challenge of how to identify what internal patents we are to focus or external efforts on it does not matter. The same goes the other way around, there is no need to know what someone else might pay million of dollars for if we have no organisation to support or even approve of the deal in a sufficient way.

Overall I think we must realise that there still is a defensive view on IP in general and specifically regarding patents. That view is probably one of the many reasons why the challenges presented

above occur. In the same way one might argue that the biggest challenge is that there is no standardized market to trade patents on, but I would argue after the study that we have to solve these internal challenges presented above before we can create a market, or at least we have to do so in parallel. There is simply no need for a market if we are not able codify what we control in a way so we can determine what patents that might hold value for external actors, what should we otherwise bring to the market? In the same way we need to be able to assess the risk of such a project in a way so that the challenge of operating versus non-operating revenue can be solved.

If we as a next step were to investigate how to solve these challenges I still think that outbound open innovation holds a great potential for many operating companies, but when the field seems unsecure and business are going well who would want to take a risk that they cannot even asses in a trustworthy way?

My hypotheses, based on the findings above are that the challenge of estimate internal risk of external patent exploitation in a non-coercive way is the challenge that directly and indirectly restrains external patent exploitation in an operating firm. The challenge of estimating risk in a good way often also affects and makes other challenges hard to overcome. I mean, it is extremely challenging to convince a manager with decision authority to choose licensing revenue over operational if the manager do not trust in the potential risk of doing,

Further I would argue that the challenge of knowing what the firm internally control that hold potential value is an almost equally big challenge for the firm to solve in order to boost external exploitation. With a better knowledge of what the firm holds I, as well as the respondents believes that more technologies and patents could be externally exploited. Even though the challenge of risk assessment might be the challenge that hinders more deals I think that by codifying internally held IP firms can boost their opportunities for external exploitation and hence also generate higher revenues and present a better bottom line.

7. Suggestions for further research

A first suggestion for further research would be to conduct a larger study where a larger number of cases are investigated in order to better be able to generalise and test the findings from this study. Such a study would test if the hypotheses that the challenge of risk assessment and identification of what patents to exploit are generalizable.

Another suggestion is to study how to identify internal patents or assets with a potential use for external exploitation. Such a study will be highly interesting in the process of enabling better understanding of how firms can externally exploit their patents in a more efficient way. The same will hold regarding the risk assessment, a study on how risks can be assessed regarding external exploitation would definitely enable further development within the field of open innovation for operating companies. There is a large need for best practises and frameworks in relation to both these fields; hence a study on how to create such frameworks would be interesting.

Further a study where the insights from an operational perspective as well as from top management at the same firms are compared would be interesting in order to investigate potential gaps in management strategies or to visualise how challenges that hinders external exploitation are viewed from both perspectives at the same time in the same firm.

Interesting to the field would also be a study where operating and non-operating companies are compared in relation to challenges of external patent exploitation in a non-coercive way. As seen the respondents in this study claims that the challenges thy meet in relation to for example risk assessment or the strategic dilemma is more relevant to an operating company. Such a study would be interesting to se if so are the case and potentially what challenges do non operating companies consider to be the biggest instead.

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9. Appendixes

Appendix 1 – Form sent to Interviewee prior to the interview

My research is focused on

External patent exploitation (meaning value creating by leveraging patents outside of the firm through for example license, sell etc.) and the challenges of performing such an activity
The goal is to research and present, what people skilled din the art of IP, (not CEO's/executive directors) perceive as key challenges to conduct ex-ante (carrot) exploitation of patents and how those challenges differ or not differ from performing forcing (stick) licensing.

My definition of carrot and stick licensing

Non-coercive or carrot licensing/exploitation refers to the situation where a patent offered to an actor outside of the company as an opportunity. The approached actor is not practicing the patented invention and does not "have" to take a license. Here the focus is to offer a value for the potential licensee, a value that will make the potential licensee willing to license the patent.

Forcing or stick licensing refers to the situation where a patent probably is infringed by the potential licensee. In this case the holder wants to be paid because the potential licensee is infringing the patent.

Examples of Questions to think of

I. When it comes to out-licensing/external exploitation patents, how is such an opportunity generally identified?

II. What functions/actors (internally and externally) are generally involved when it comes to out- licensing patents/technology?

III. Do you actively look for licensing opportunities in relation to actors that you do not suspect are infringing your patent portfolio? (carrot-licensing) Why so? Do you work the same way for potential infringers?

IV. What would you consider being the biggest challenges in performing carrot (non-coercive) and forcing (stick) licensing? Examples?

V. Are there any major gates/decision points in the process of an out-licensing deal? Are those different in regards of a carrot or stick situation?

VI. Which two challenges do you consider hinders most deals regarding external patent exploitation in a non-coercive way?

Appendix 2 – Interview form used by the researcher

Introduction

Present my self, who am I, what am I doing here, what is the focus on my academic project, what is the focus of my non-academic project here?

Explain that answers will be publicly available but explain that their names and the name of the firm will be kept confidential

Present the Research Question

> *From an operational perspective, what are the key perceived challenges for external patent exploitation /outbound open innovation, in a non-coercive way within an operating company?*

Explain that I and the other researcher in the room will take notes

Root level Questions

I. Who are you? How long have you been here? Shortly how would you describe your job in terms of task

II. When it comes to out-licensing/external exploitation patents, how is such an opportunity generally identified?

III. What functions/actors (internally and externally) are generally involved when it comes to out- licensing patents/technology?

IV. How you actively look for licensing opportunities in relation to actors that you do not suspect are infringing your patent portfolio? (carrot-licensing) Why so? Do you work the same way for potential infringers?

V. What is the most challenging part of your job?

VI. What would you consider being the biggest challenges in performing carrot (non-coercive) and forcing (stick) licensing? Examples?

VII. Are there any major gates/decision points in the process of an out-licensing deal? Are those different in regards of a carrot or stick situation?

VIII. Which two challenges do you consider hinders most deals regarding external patent exploitation in a non-coercive way?

IX. Anything you want to add that I have not asked about that is interesting in relation to external exploitation.

Ending

Is there anything that you told us that you would like to change or that you do not want me to include in my academic report?

Thanks / Bedankt en tot ziens