



Business Value Enhancing Factors of Aligning IP Strategy with Corporate Strategy

Master Thesis

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Abstract

Despite the increasing awareness of, not only the importance of IP and IP strategies, but also the importance of aligning these with the overall corporate strategy, there seems to be a lack of integration between IP strategies and corporate strategies, as well as lack of integration between IP functional units and other functional units of the businesses, leading to IP value not being exploited to its full extent.

We suggest, that making IP strategy part of the business plans and overall company strategy can enhance perceived value of a company as this may influence resource efficiency, perceived value, and IP value extraction.

A case study of the proposed topic was performed, by literature review, building a chain of evidence, which was later confirmed through interviews performed with technology based and IP intensive companies in the Nordic region, which have chosen/not chosen to incorporate an IP strategy.

Based on the literature studies and the interviews, three main factors enhancing firm value by positively influencing resource efficiency, perceived value, and IP value extraction, resulting from the alignment of IP strategy and corporate strategy have been identified. These factors are management involvement, internal and external collaboration, and organizational IP awareness.

Top management's involvement in IP strategy has been shown to be associated with better IP performance in the companies that have aligned their IP strategy with their business strategy. Further, the active use of companies' Intellectual Property Rights (IPR), resulting in exploitation of IP value by for example licensing deals, collaborations, negotiations, enforcement or improved competitiveness, is higher among these companies.

Notably, with regard to collaboration and organizational structure, the companies with integrated IP strategy also indicate a higher level of collaboration across functional units as well as higher collaboration with respect to IP than do companies without an integrated IP strategy. A good correlation between IP strategy and corporate strategy is likely to increase the understanding of IP within the whole of the company. Together with clear cut rules in the organization promoting efficiency and higher levels of creativity, this constitutes part of an increase in company value.

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1. Introduction

Intellectual property rights (IPR)¹ constitutes a significant portion of enterprise value and intellectual property (IP) is of increasing importance for many companies (Fisher III & Oberholzer-Gee 2013; Reitzig 2007). Top management involvement in IP strategy has been shown to be associated with better IP performance (Reitzig 2007). This increased importance of IP is demonstrated for example by top level managers including IP related considerations when judging the attractiveness of new markets and the board also becoming involved when the corporate reputation is at stake in IP related litigation (Reitzig 2007). Owing to the crucial role of IP in a firm's potential value, firms need to ensure that their investment in IP yields a strategically targeted IP portfolio, delivering IP of quality and business value. It is further of importance that a company's business plans and business model shape its IP strategy (Lynskey 2009). When IP strategy is integrated with corporate strategy, IP activities can contribute to achieving corporate strategy which results in business growth (Tanaka 2013b).

To relate IP strategy to company strategy, several aspects of the IP situation need to be clarified to properly assess the competitive situation. Such aspects are the competitive landscape with respect to IPR, proven successful strategies for using IP at the corporate and business unit level, the role of the board in the IP strategy, the organizational structures supporting IP related strategies, pitfalls to avoid, and the dos and don'ts of working with IP (Reitzig 2007). The increasing corporate value of IP means managers must take a strategic approach to the issue, treating IP as any other strategic issue facing their organization (Reitzig 2004). Established licensing firms treat IP as a manageable asset incorporated into the business planning process (Lynskey 2009).

There has been observed an increasingly strategic use of intellectual property and increasingly companies are focusing both on technical and non-technical protection. Thus, the leaders must think about IP when they judge the attractiveness of a market, both in relation to geography and technology. In order to properly assess their competitive situation, they must further consider how IP influences competitive advantage, industry structure, entry barriers, competitors, suppliers and organization, just as for any other strategic issue. It has been shown that corporate management's genuine involvement in IP related projects is a success factor for driving IP performance, adding value by saving time and allowing for efficient operation at functional levels and higher returns from innovation (Reitzig 2007).

However, despite the increasing awareness of the importance of aligning IP with corporate strategy, many firms do not integrate their IP departments with other functional departments. This could inhibit business growth (Germeraad 2010) and imply that IP strategy is not implemented well in the real business situation (Tanaka 2013b). According to Fisher and Oberholzer-Gee (2013), few corporate leaders understand the value and importance of IP and are not involved in the strategic planning of IP but delegate the planning to legal staff with little

¹ see further section 2.1

involvement in strategic planning and decision making. This delegation impedes the strategic view of IP, which is one of the many obstacles with this limited integration of IP management and strategic planning. Other obstacles include lack of common framework or language, wasteful use of resources as the product or services developed may not meet market demand or legal opportunities available. Further, managers may not choose the best way for value extraction of the IPRs, such as using it to suppress competition or challenging validity or scope of a competitor instead of considering other opportunities such as developing alternative products or services, securing licenses, deterring litigation, or deploying an infringing product (Fisher III & Oberholzer-Gee 2013). To make IP a strategic weapon, IP related questions must be handled with a strategic approach and not left to functional management and IP departments alone (Reitzig 2007).

Failure to align IP strategies with corporate strategies and environmental factors will prevent these from reaping their full potential. Strategic IP management must be developed and integrated with technology and corporate management to foster success (Holgersson 2012). By making knowledge of how IPR can be used to gain and sustain competitive advantage; how IPR can affect industry structure; what options IPRs offers vis-à-vis competitors; how IPR can grant incumbency advantage and establishes barriers to entry and help gain vertical power along the value chain; and what organizational design that accommodates an IP strategy most effectively, available to top level management, companies will be able to tap into the strategic value of IP (Reitzig 2004). IP management skills such as sourcing, control, commercialization, licensing, valuation, and pricing; and IP contracts lead to increased efficiency of interorganizational technological relationships and quasi integrated organizational forms, and thus to increased innovativeness and economic development (Holgersson 2012).

As the literature illustrates, awareness of IP and IPR are increasingly important, as is the alignment of IP strategy with corporate strategy to tap into the full benefits and value of IP. However, despite of this, there seems to be a lack of integration between IP strategies and corporate strategies, as well as lack of integration between IP functional units and other functional units of the businesses. One hypothesis why this lack exists, as suggested by Fisher and Reitzig, is that corporate leaders do not fully understand the value that can be exploited from IP and the strategic view that needs to be taken to fully appropriate the value therein (Fisher III & Oberholzer-Gee 2013; Reitzig 2007). In this thesis, we aim to explore in what way making IP strategy part of the business plans and overall company strategy can enhance the value of a company, i.e. how integrating IP strategy with corporate strategy may affect organizational efficiency, perceived company value², and the ability to create IP and extract its value. To achieve this, a literature review has been conducted in combination with interviews with a number of technology based and IP intensive companies.

² Real value is related to the actual cost while perceived value is what consumers think a product is worth. As IP is more related to perceived than tangible value, the perceived value has been considered of higher relevance for this thesis, see further section 1.4.

1.1 Background

IP management is often highlighted and is in some contexts the new buzz word, but can integration of IP strategy into corporate strategy enhance firm value? The tasks associated with the execution of proper IP strategy are many: The list is extensive and complex, and it is easy to assume that structured management of the same is required. However, researchers appear to be in agreement that companies are lagging behind in this matter. Japan, as a country, and a few well-known large corporations, are viewed as something of processors with regard to the organizational implementation of an IP strategy (Reitzig 2004).

IP strategy is an important part in a firm's competitive advantage and, as defined by Porter, strategic response to competition is essential in order to sustain long term profitability, which further highlights the importance of strategic management of IP, just like any other important asset of the firm. Porter's definition of strategy as being to understand and cope with competition and that strategy can be viewed as building defenses against competitive forces, can be related to the generic patent strategies of a firm. Regardless of being proprietary, defensive, or to provide leverage, they all serve, in some way, to defend the company against competitors (Porter 2008).

Much is said about the importance of integrating IP strategy into business strategy, still many companies fail to take IP into consideration when formulating their business strategy (Tanaka 2013b). The companies that do bring about an IP strategy may be under the impression that the strategy does mirror their business, but according to the literature, this may be true in theory, however, not in practice (Fisher III & Oberholzer-Gee 2013; Tanaka 2013a; Tanaka 2013b). Although the IP strategy should be a consequence of corporate strategy, according to Germeraad (2010), Tanaka (2013b) and Lynskey (2009), often, it is not. It is important to study this topic, because the theory regarding the benefits of alignment of IP strategy and corporate strategy appears to be unanimous, however, still companies proceed to not implement it fully into the actual business and thereby potentially miss opportunities to exploit IP value. Reasons for not aligning strategies may be unawareness of the concrete benefits that it may contribute to and the strategic views that need to be taken to fully appropriate its value, thus there is a gap of knowledge to be filled regarding which value enhancing factors that are influenced upon aligning IP strategy with corporate strategy.

The literature points to IP still being something along the line of its own unit, with no integration/collaboration with other parts of the business. There appears to be a lack of knowledge of the importance of IP value, and the value is not exploited as it could be (Fisher III & Oberholzer-Gee 2013; Reitzig 2007). There is, as will be evident in the theory sections below, much theory on the subject of IP strategy as part of a business strategy, however it still appears to be a theory and many times remain as just that, a product brought about for insurance purposes and not an integral part of the entire business, fully implemented throughout all parts. Our intention is to study the factors that aligning IP strategy with corporate strategy can influence,

thus intending to increase the understanding of the importance of aligning IP and corporate strategy and raising the awareness of the contributive value of this.

1.2 Problem Discussion

As mentioned, IP rights constitute a significant part of enterprise value and despite this, only one half of corporate leaders understand the value and importance of IP, reflecting a number of obstacles. Examples of such obstacles are: lack of common framework and language; poor integration between R&D, strategy, and legal functions, which in turn is correlated to missed opportunities to create and exploit the value of IP (Fisher III & Oberholzer-Gee 2013).

Too often, the goal of securing IPR is relegated to a postscript in many firms. In new technology based firms (NTBFs), for example, IP, if considered at all, is viewed merely an afterthought in the cycle of generating a business idea, undertaking R&D, manufacturing a product, meeting standards, or attracting finance, instead of being recognized as the core of the firm. Without IP, the NTBF has little or no business value, and the IP should be considered with the formulation of the firm's business strategy (Lynskey 2009). Traditionally, researchers and developers have autonomously followed their interest without paying attention to the appropriability of their inventions (Reitzig 2007). IP departments have been separated from the business, market, and customers without enough collaboration with other functional departments. Without collaboration between departments, IP activities cannot be implemented successfully and the correlation between collaboration and business growth will be absent (Tanaka 2013a).

Further issues that can arise with respect to IP and the consideration of this with respect to the business plan or corporate strategy, are within open innovation and the ability to continue to create value after the expiration of a patent. In the case of open innovation, contingency contracting is always incomplete, potentially leading to ex post disagreements and disputes. Each actor needs to ensure that it has sufficient freedom to operate and the IPRs required to support its business (Granstrand, Holgersson 2014). Yet another issue is that, as patents expire, generic versions of the product can appear, which can lead to declining revenues, also known as the patent cliff (Jimenez 2012).

Innovations and technological developments have been recognized for their central importance for economic success and growth. IP has become an important source of competitive advantage at micro level in many industries which has led to an increased importance of strategic IP management (Holgersson 2012). Top management involvement in IP strategy has been shown to be associated with better IP performance (Reitzig 2007). For example, managers should be prepared to shift focus from patents to trademarks as patents expire (Reitzig 2004) or to fund development of new ideas as replacement to those with expiring protection (Jimenez 2012). Also, strategic management of IP in open innovation can build an IP base by reassembling IP over several generations of projects which can be remade as a virtue in the form of a business model that leverages assembly and disassembly to build and capture knowledge resource (Granstrand, Holgersson 2014). Further, a good correlation between IP strategy and corporate

strategy is likely to increase understanding within the whole of the company for IP, and likely this constitutes part of an increase in company value (Reitzig 2004).

The reasons why firms fail to extract business value from IP include under appreciation of importance, concepts and tactics of IP, absence of internal processes to extract, evaluate and capitalize IP, insufficient or unreliable knowledge of competitive IP, and misalignment between IP strategy and overall business strategy. To maximize the business value of IP, alignment between business strategy and IP is needed (Lynskey 2009).

It is evident that strategic management of IP is increasingly of importance and is a source to fully exploit the value that IP can possess. From the current literature, it is also to be noted the stress on the importance of aligning the IP strategy with the business plan, but how can integrating IP strategy into corporate strategy enhance firm value?

1.3 Problem Formulation and Purpose

The focus of this thesis is on how integration of IP strategy into corporate strategy can enhance the perceived value of a company. Studying the literature, there is an awareness among researchers and companies of that there is value to be added by integrating the strategic management of IP with the overall business plans (Lynskey 2009; Tanaka 2013b) but, despite this, many companies fail to implement this integration (Germeraad 2010). Reasons may be unawareness of the potential value, and the concrete benefits such as increased firm value as a consequence of for example higher quantity/quality of IP (leading to higher potential for value extraction) or organizational efficiency that can be tapped into. For this reason, our intention is to investigate which factors that enhance firm value as a consequence of aligning strategic management of IP with corporate strategy.

The purpose of the thesis is to investigate the role that integrating a firm's IP strategy with its business strategy may play in influencing value adding aspects of a firm such as the firm's resource efficiency, perceived value, and IP value extraction. Further explained, the purpose is to show that there is a correlation between implementation of an IP strategy, that is aligned with the corporate strategy, and increased perceived value of a company and that this correlation relates further to how value can be created and captured, for example by increased innovativeness among the employees, better collaboration between functional units, organizational efficiency, and more active use of IP assets.

1.4 Delimitations

This thesis aims to focus on the beneficial implications of alignment of IP strategy with corporate strategy. Even though there seems to be an awareness of the possible value increase that can be tapped into by aligning the two, many companies still fail to exploit their IP value by not strategically managing their IP in line with their overall business plan. Areas that will not be covered by this thesis include innovation management and innovation strategy.

Innovation management and strategy are closely related to intellectual property

management and strategy as innovations give rise to products or processes which may be part of a company's intellectual property. However, innovations are defined as a new idea, successfully commercialized and put into practice, while intellectual property is a legal right, depending on the relevant national laws, and arises from unique value adding creations developed from human ingenuity, creativity and inventiveness (inventions). While being interlinked and intertwined, innovations concern the commercialization of a new idea, while the invention may not necessarily be associated with commercialization (Kalanje 2017). As is understood, this is a complex relation and distinction which, together with the management and strategies that foster successful commercialization of innovations, has been left outside the scope of this thesis. One exception with regard to the concept of innovation has been made however, which is to include open innovation as part of strategic management of IP. The reasoning behind this exception is that the flow of ideas across firm boundaries in open innovation is commonly associated with a set of registered or unregistered IP ownerships and rights, allocated through managerial and legal decisions associated with IP, thus making open innovation an important aspect of strategic IP management.

Further, literature mainly focusing on strategy or IP in general have only briefly been reviewed in their relation to the focus area of the study, namely, how the integration of IP strategy into corporate strategy is beneficial for corporate value.

When it comes to evaluating the value of a product, the product here being the company, there are, according to Edwards (2014) two way to measure this, real value and perceived value. Real value is related to the actual manufacturing cost and the price a product is sold at for profit. In layman's terms, the real (or actual) value is what the product is actually worth, without any outside expectations from the consumer or seller. Perceived (or intangible) value is what consumers think a product is actually worth (Edwards, 2014). In this thesis, only the perceived value will be investigated, since neither of the companies interviewed will be sold within the time frame of this study, thereby information regarding an actual value will be outside the scope of this investigation. In addition, according to a TED talk by Roy Southerland (Southerland 2009, se Edwards 2014) looking to perceived value can be just as satisfying as looking to the real value, and adjusting a product intangible value within a marketing strategy can provide an efficient and cost saving method to increase the overall value. Further, as IP is more related to perceived than tangible value, the perceived value has been considered of higher relevance for this thesis.

Finally, strategy as such is briefly covered in the theoretical chapter, while overall corporate strategies and strategic management of companies covers a vast amount of theories and have thereby been left outside the scope of this thesis.

1.5 Thesis' Structure

The thesis consists of a theoretical chapter, chapter 2, where the main sources of theories and current literature are briefly summarized and commented on in relation to our chosen topic.

A brief overview of the concepts of IP and IPR is also included. This section is followed by a chapter describing the methods used to conduct the study, a chapter on the findings of the study, as well as a chapter on the data analysis and, finally, the conclusions from the study.

2. Theory

Literature streams that have been used in the data collection phase include articles found in journals such as HBR, Research, Technology Management, and MIT Sloan Management Review, and relating to corporate strategies, IP strategies, as well as IP management. The literature chosen for review mainly focuses on the benefits and disadvantages with alignment between IP strategy and corporate strategy. Further literature streams include course literature such as Managerial Economics by Keat et al, and Management Control Systems by Merchant et al. but also web pages and a YouTube clip with a TED talk of interest.

2.1 IP/IPR Basics

To understand IP and IPR it is perhaps good to start with some basics. Intellectual Property (IP) is the terminology used for creations of the mind and these creations may under some circumstances be subject to exclusive, registrable rights, Intellectual Property Rights (IPR). Examples of IPRs are patents, trademarks, design, and copyright. But IP may also be branding, trade secrets, know-how, and various agreements. IP presents means for controlling relationships with competitors, partners, suppliers, employees, customers etc. It can be beneficial to protect a product or process with more than one type of IPR or IP.

It is further important to recognize that among the IPRs, patents do not confer the right to commercialize an idea or invention. Rather, a patent is a ‘negative right’ that provides a limited (temporary, local and exclusive) monopoly by which the owner of the patent has the right to exclude others from practicing (making, importing, using or selling) the invention described in the patent’s claim set in the jurisdiction(s) that the patent is valid. With regards to patents, another essential principle to realize is that it is not what is disclosed in a patent as a whole that is protected: it is only what is claimed that defines the scope of protection. Any other information being disclosed in a patent is knowledge that can be used by anyone, why heed has to be taken not to disclose know-how that is valuable to the patent applicant and perhaps should be kept a trade secret (Lynskey 2009).

2.2 Strategy Basics

Strategos (Greek for Strategy), “the art of the army general”, has entered into the vocabulary through the military (Mintzberg 1987). Strategies, as commonly recognized, are deliberate plans conceived in advance for determining specific decisions into the future. Game theory exemplifies strategy as the set of rules that governs the moves of the players while military theory exemplifies strategy as large scale, long range planning and development “to ensure security and victory”. In management, the typical definition is “the determination of the basic long term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals”. Common for all of these examples is that strategy is explicit, developed consciously and purposefully, and made in advance; thus it is a plan (Mintzberg 1978). The goal of any generic strategy is to create value

for buyers that exceeds the cost of doing so (Lynskey 2009).

Further a strategy can be defined as “a pattern in a stream of decisions”, that is consistency in a sequence of decisions over time (Mintzberg 1978). Whether or not intended, strategy is consistency in behavior (Mintzberg 1987). Strategies are typically a combination of deliberate (or intended) and emergent strategies, meaning that they are a combination of patterns of decisions realized as intended and patterns of decisions realized despite or without intentions (Holgersson 2012). There may also exist unrealized strategies, i.e. intended strategies that do not get realized, perhaps because of unrealistic expectations, misjudgments about the environment, or changes in either during implementation (Mintzberg 1978). Strategy is also a perspective that is shared through intentions or actions by the members of an organization (Mintzberg 1987).

To sustain long term profitability, strategic response to competition is essential. Porter has defined five forces that determine the profitability of an industry and which are the forces that shape strategy and industry structure. Porter further defines that formulation of strategy is to understand and cope with competition and that strategy can be viewed as building defenses against competitive forces (Porter 2008).

Strategy formation in most organizations can be thought of as revolving around the interplay of three basic forces: (a) an environment that changes continuously but irregularly, with frequent discontinuities and wide swings in its rate of change, (b) an organizational operating system, or bureaucracy, that above all seeks to stabilize its actions, despite the characteristics of the environment it serves, and c) a leadership whose role is to mediate between these two forces, to maintain the stability of the organization's operating system while at the same time ensuring its adaptation to environmental change (Mintzberg 1978).

In relation to strategic IP management, this refers to the formulation and execution of strategies related to technological IP, including issues such as how to acquire and create IP, how to govern IP, and how to exploit and extract value from, or commercialize, IP. IP management can be offensive or defensive and can be used to create a competitive advantage as well as they are a means for technology and competitor intelligence (Holgersson 2012).

2.3 IP Strategy

IP rights constitute a significant fraction of enterprise value (Fisher III & Oberholzer-Gee 2013). In recent years, the primary focus of value for many corporations has been found in their IPR and in the late 1990s three quarters of the Fortune 100's total market capitalization was represented by IPR (Reitzig 2004). It is understandable that IP has increasingly become an area of focus at many companies and that top level managers include IP related considerations when judging the attractiveness of new market, and also that the board becomes involved, for example, when the corporate reputation is at stake in IP related litigation (Reitzig 2007).

Owing to the crucial role of IP in a firm's potential value, firms need to ensure that their investment in IP will yield a strategically targeted IP portfolio; that is, it should deliver a portfolio of IP products of quality and business value. In order to achieve an IP portfolio in

alignment with the business's strategic vision and where each invention is evaluated and protected in light of the firm's IP and business strategies, it is of importance that a company's business plans and business model shape its IP strategy (Lynskey 2009). When IP and business strategy are aligned, IP activities contribute in achieving corporate strategy, resulting in business growth (Tanaka 2013b). Top management involvement in IP strategy has been shown to be associated with better IP performance (Reitzig 2007). Providing top level management with knowledge of how to use IPR to gain and sustain competitive advantage, how IPR affect industry structure, what options IPR offer vis-à-vis competitors, how IPR grant incumbency advantage and establishes barriers to entry, how IPRs help gain vertical power along the value chain, and what organizational design that accommodates an IP strategy most effectively, will enable companies to tap into the strategic value of IP (Reitzig 2004).

While large firms have increasingly developed their IP strategies and especially their patent strategies, many small firms have problems with properly benefitting from the patent system (Holgersson 2012). In some cases, IP is viewed merely as an afterthought in the cycle of generating a business idea, undertaking R&D, manufacturing a product, surmounting scientific and regulatory hurdles, meeting standards, attracting investors etc. That is, IP is still viewed as an insurance instead of a tool that may leverage the business of a company (Lynskey 2009).

The failure to extract business value from IP are often due to under appreciation of importance, concepts and tactics of IP, absence of internal processes to extract, evaluate and capitalize IP, insufficient or unreliable knowledge of competitive IP, and misalignment between IP strategy and overall business strategy. To maximize the business value of IP, alignment between business strategy and IP is needed (Lynskey 2009).

Further, it is important to define IP strategy according to each business unit of a company. As such, each business unit should have strict responsibility to establish IP strategy by close collaboration with the IP department (Germeraad 2010). When setting an IP strategy, it is of importance to understand both the inside and outside environment. To analyze external opportunities and threats traditional tools like PEST analysis or Porters five forces analysis may be used. To analyze a company's own strengths and weaknesses, tools such as the value chain analysis or VRIO analysis may be suitable. After making these analyzes on the internal environment and external resources, a strategy formulation process can be constructed using SWOT or 3C analysis, as proposed by Tanaka (Tanaka 2013b).

During the IP strategy formulation process, basic theory for business strategy such as Porter's three basic strategy, strategy according to the competitive position by Kotler, Ansoff's growth vector, product portfolio management by BCG, core competence by Hamel and Praharad are fundamental. In addition to these processes, which can be used within any field, such as sales, production, marketing, and HR strategy; IP specialties have to be considered in IP strategy and these specialties have to be integrated into the basic strategy making process (Tanaka 2013b).

A study by Tanaka has illustrated that IP people do not have good understanding of the

strategy making processes, why they are poor at making fair analysis on opportunities, threats, strength and weakness. Without these analyzes, the IP strategy finds difficulty to be integrated with corporate business strategy, which results in that the IP activities fail to contribute to the corporate management as a consequence of not being able to identify how to make the best use of their strength to take an identified opportunity or avoid a threat in accordance with the overall strategy and vision. A key for business growth and strength is the shared strategy of different internal organizations targeting the same goal (Tanaka 2013b). A good IP strategy, that produces high quality IP of maximum business value, should focus on all parts of a structured IP manufacturing process, which includes: invention generation and documentation, reviewing documented inventions, and selecting which ones to leverage through for example licensing or protection. Without a well-defined strategy, the IP development process may be halfhearted and ineffective (Lynskey 2009).

Tanaka has proposed a 19th strategy menu, containing 19 IP strategies implemented by a number of enterprises with varying circumstances and goals (Tanaka 2013b). Miller, on the other hand, has found eleven types of innovation strategies utilized in management of R&D. Miller identified two key elements that drove innovation strategy, the time it takes to create a working technical prototype of a new product or service, and the time it takes for a prototype product or service to reach the market. The best practices to manage innovation and create IP vary by these two key drivers: time-to-prototype and time-to-market, why it follows that the practice for managing and leveraging IP varies along the same axes (Germeraad 2010; Miller and Floricel 2004).

Tied to Miller's eleven strategies, Germeraad has found seven key patent portfolio attributes that shape the IP portfolio value. These seven attributes being: portfolio size, the need to create "patent fences" (networks of related patents designed to protect core "grandfather" patents for an extended period of time), the speed of patent creation, the momentum of the portfolio toward growth or shrinkage, and the quality, scope, and geographic coverage of patent claims. Looking further into each of the eleven types of games of innovation and addressing each of them with the seven key patent portfolio attributes, will present recommended IP strategy attributes to consider for each of the eleven types of innovation strategies (Germeraad 2010).

There has been observed an increasingly strategic use of intellectual property and increasingly companies are focusing both on technical and non-technical protection. Though there is no single optimal approach for all firms, corporate managements genuine involvement in IP related projects is a success factor for driving IP performance (Reitzig 2007). Generic patent strategies can be exemplified by proprietary strategy, which focuses on isolating and protecting a company's competitive advantages from imitation; defensive strategy, which covers how companies protect themselves from other companies' patents; and leverage strategy, treating how companies make use of patents to reach a positive return in different context (Holgersson 2016).

2.3.1 Strategic Management of IP

Needless to say, intellectual property systems can be valuable management resources when IP is effectively created, properly protected, and utilized on the market (Tanaka 2013b). Innovations and technological developments have been recognized for their central importance for economic success and growth and IP has become an important source of competitive advantage, which has led to an increased importance of strategic IP management (Holgersson 2012).

Strategic IP management has three elements, firm level governance, acquisition (value creation), and exploitation (value extraction) and refers to formulating and executing strategies related to technological IP, including how to acquire and create IP, how to govern IP, and how to exploit and extract value from or commercialize IP. Firm level IP governance is an overarching element of strategic IP management and includes how to control and coordinate the IP, being interdependent with strategies for both acquisition and exploitation, how to monitor and enforce IPRs, and how to monitor the accessibility of the technology for outside agents. Strategic IP management also has an important role in form of competitiveness, impacting all the competitive implications, value, rareness, cost to imitate, and exploitability by the organization of a firm's tangible and intangible assets used to implement its strategies (Holgersson 2012).

IP management is at core for general management and IP strategies have to be aligned with corporate strategies and environmental factors to reap their full potential. There is an important connection between strategic IP management and technology management, which in turn is an important part of general/corporate management, thus making an important connection between IP management and general management (Holgersson 2012).

The leaders of a company must think about IP when they judge the attractiveness of a market, both in relation to geography and technology. It would make no sense to embark on a venture if, for IP reasons, not enough market could be covered or product development would be impeded, as noted by one CEO (Reitzig 2007). When considering to enter a line of business, managers can consider to challenge the scope or validity of a competitor's right, develop an alternative, secure a license, build a portfolio of IPR to deter litigation, or deploy an infringing product. Among these options, there is no best way but the firm should weigh the relative cost and benefits in short and long term perspective (Fisher III & Oberholzer-Gee 2013).

IP related decisions of strategic importance should not be delegated to specialists without involvement in strategy formulation and implementation (Fisher III & Oberholzer-Gee 2013). IP personnel need more understanding of the fundamentals of strategy making in the field of business management, so they can propose an IP strategy menu in the implementation of IP strategy making (Tanaka 2013b). Managers making the decisions, however, all too often cannot appreciate the high degree to which the costs and benefits are influenced by laws governing the IPRs. Early integration between managers, lawyers, and engineers is critical to identify the best opportunities for deploying IP. Managers need to decide between which type of protection is most suitable, for example patent, copyright, or trade secret, as well as that they need to take into

account the rules governing IP cases in each jurisdiction (Fisher III & Oberholzer-Gee 2013). For example, combining trademarks and patents can help sustain IP based competitive advantages. Also, managers should be prepared to shift focus from patents to trademarks as patents expire as post expiration patent value of, for example, a drug is enormously affected by the product's marketing before expiration of the patent (Reitzig 2004). Earlier engagement between managers and lawyers could result in products and services being designed in a way reflecting market demand and the legal opportunities and constraints to better exploit the resultant IP (Fisher III & Oberholzer-Gee 2013).

Strategic IP management is not only about maximizing excludability and must be developed and integrated with technology and corporate management to foster success. Development of IP management skills such as sourcing, control, commercialization, licensing, valuation, and pricing; and IP contracts lead to increased efficiency of interorganizational technological relationships and quasi integrated organizational forms (such as partnerships, joint ventures, co-ownerships, cross licensing schemes, etc.), and thus to increased innovativeness and economic development.³ Important factors for IP management are innovation type, firm size, industry type, technology complexity, IP regime and laws, and market structure. Proper patent management rather than patent quantity is conducive for firm success (Holgersson 2012). For example, Technical IPRs has often been thought of as a way to protect vertically differentiated products, technological breakthroughs, but in many areas horizontal differentiation is more valued by customers (Reitzig 2004).

To compete effectively, large corporations must respond quickly and creatively to opportunities where they arise. Standardized management practices and technologies allow people to stop wasting energy on basic activities and instead focus on higher order concerns (Kanter 2008). The key strategic processes should place the company where the flow of opportunities is swiftest and deepest. The processes might include innovation, partnering, spin out creation, or new market entry. As argued by Eisenhardt and Sull, with regard to strategy formulation in general, rather than picking a position or leveraging a competence, managers should select a few strategic processes and rather than elaborate strategies, they should craft a handful of simple rules. The simple rules provide guidelines within which managers can pursue opportunities (Eisenhardt & Sull 2001).

Intellectual property is today a significant part of companies' total assets (Holgersson 2016). Learning and developments in IP management are conducive for economic growth and welfare (Holgersson 2012), thereby making management of IP a key for a company's competitive advantage (Holgersson 2016).

Strategic management of IP involves strategic management of a company's resources with regards to their organization and collaboration (Germeraad 2010; Reitzig 2007). Further, it

³ Our interpretation is the non-formal substructures that may develop across the traditional organizational structure, allowing for a better integrated communication pattern within an organization, particularly across units that have not previously had any natural contact points.

involves the strategic aspects of the IP value chain which may be seen as a framework to maximize IP and business value (Lynskey 2009). How to manage open innovation is also a matter of strategic IP management to leverage the business (Alexy, Criscuolo & Salter 2017) as well as how to best extract business value from licensing deals or knowledge sharing (Fisher III & Oberholzer-Gee 2013). These aspects will be further considered in the following sections.

2.3.1.1 Organization and Resources

How can managers make sure that everyone in an organization is focused on the same strategy but has the flexibility to adapt to local circumstances? According to Eisenhart and Sull, the answer is not a complicated framework but a set of simple rules that help employees make decisions on the fly, act on them, and respond quickly to shifts in the environment (Eisenhardt & Sull 2012). IP performance can be enhanced by organizational arrangements with clear cut rules about IP, saving time and allowing for efficient operation at functional levels. An organizational structure where IP officers are included in top management decisions has been correlated to better IP management performance (Reitzig 2007).

In order to define a patent strategy, close collaboration between the IP department and other functional departments such as sales/marketing and R&D department is necessary. There is difficulty in making IP strategy in case there is lack of collaboration with other departments. Further, the IP department has to have close collaboration with the engineering department, not to lose the opportunity to pick up valuable technologies created inside the enterprise and also with HR and communications department for the commercial point of view. The IP department has to broaden their sights to serve as a bridge among different functional departments. The IP department also has to work to create and strengthen competitive forces through IP strategy making by having sufficient collaboration with strategic functional departments. If there is not enough collaboration with concerned departments of standardization, IP value cannot be expanded further (Germeraad 2010).

Studies have been performed and books written, suggesting the importance of increased collaboration within departments or units, within a company. Such an increased collaboration could increase business growth. It has been found that IP experts tend to concentrate on their expertise in law and regulations, a behavior which renders it difficult to collaborate with other departments. A study by Tanaka has suggested a correlation between collaboration and business growth (Germeraad 2010).

Three factors have been shown to make the IP department contribute more to corporate level through integration with other functional departments. These factors include: the collaboration with the department involved in the corporate business operation (management planning, marketing, purchasing, quality control, information technology, and technical services), the collaboration with the departments of indirect supporting functions (human resource, general affairs, finance/accounting, public relations and legal affairs), and the collaboration with the department having core function as key strategic values (R&D,

production, sales, overseas business and management members). The first two factors, i.e. collaboration with management planning and IT departments are, more than the third factor, correlated with the growth of sales (Tanaka 2007). Cooperation among different functional areas of a company with regard to IP related tasks are more and more common and is likely a reflection of the growing diversity and importance of IP strategy at the business level (Reitzig 2007).

IP management is central to the utilization of existing resources and the development, renewal and adaptation of resources and competences. Intellectual resources require time, money, and effort to build, but are an important source of differentiation and sustainable competitive advantage. A competitive advantage exists when a value creating strategy is implemented by a firm without simultaneously being implemented by any competitors and is sustained when the competitors are unable to duplicate the competitive advantage (Holgersson 2012).

In strategic management, the so called ‘resource based theory’ of the firm suggests that exploited assets which are valuable, rare and imperfectly imitable (VRIO) will lead to sustainable competitive advantage, and that sustainable competitive advantage is necessary for a firm to earn above normal returns in the long term (Keat, Young, & Erfle 2014). Competitive advantage is only generated by competences difficult to imitate and IPRs provide an additional barrier. Competitive advantage relates to firms ability to capture and create value while innovation activities aim at creating value and capturing a share of the created value, also known as appropriability (Holgersson 2012).

The organizational structure reflects the importance assigned to IPR by top level management (Reitzig 2004). Commonly held values translate into operations through clear standards and processes. Values and standards that are embraced by individuals inspire much higher levels of creativity leading to more break-through technology, yielding benefits beyond innovation to a whole host of mutually reinforcing effects. Employees draw heavily on their shared understanding of mission and as a consequence of common platforms, standardized processes, and widely shared values and standards, coherence arises. Further, embedded values and principles permits collaboration among diverse people (Kanter 2008).

2.3.1.2 IP Value Chain

A value chain approach to IP may be seen as a framework to visualize and organize the resources needed to maximize value of IP and thereby business value. In this respect, an IP value chain may offer several benefits. Firstly, by identifying the various steps of IP development, the IP value chain can help firms reduce superfluous effort, streamline their IP development, and increase throughput. Secondly, it encourages alignment between IP and a firm's specific business objectives. Third, it improves the IP offering of the firm by creating a portfolio that covers not only core technologies, but also related products, applications, and improvements (Lynskey 2009).

The IP value chain spans from generation of intangible assets in R&D departments, to protection of IP in patent and legal departments, to use of IP by enforcement lawyers, branding specialists, and licensing professionals. The strategic management of IP spans different domains of an organization's internal value chain. An integrated IP strategy should span the entire IP value chain and can be crafted at different levels of the organization (Reitzig 2007).

There are many tasks associated with the execution of a proper IP strategy, labor has to be divided and hierarchy and control established. Western companies have lagged behind in organizational implementation of IP strategy while the vanguards are found in Japan. Toshiba, for example, has IP departments both at business unit level and corporate level. The IP units provide planning and coordination of IPR related activities (drafting of contracts, protect software, filings, hosting information center) (Reitzig 2004).

Strategic IP tasks at all organizational levels involve acquisition and generation, protection, and exploitation and enforcement of IP. Strategic IP tasks at the corporate level include analysis of industry attractiveness, M&A's, resource deployment, litigation, taxation, as well as design of organizational IP structures or procedures that interconnect different parts of the IP value chain (Reitzig 2007).

At the business unit level, tasks include, just as for the corporate level, analysis of industry attractiveness. Further it also includes integrating patent and trademark related decisions in decisions involving: creating competitive advantage, choosing the scope of strategy, differentiating products, setting barriers to entry, and managing vertical competition. Further, at business level, tasks are also to define the competitive advantage and the horizontal and vertical competition. IP management is needed at all levels of the organization, functional, business unit, as well as at top management level (Reitzig 2007).

At the functional level, the strategic IP tasks with regard to acquisition and generation are: identification of technologies relevant for customers, IP filing scope, in-licensing of IP, and filing procedure in relation to IP protection, as well as out-licensing, product design, and branding in relation to IP exploitation and enforcement (Reitzig 2007).

2.3.1.3 Open Innovation, IP Assembly, and IP Disassembly

As technology advances and the pressure of speed within development is increasing, many companies need innovation from an outside perspective to develop further and leverage their business. Open innovation is one way to achieve this (Alexy, Criscuolo & Salter 2017). The use of open innovation has grown during the past decade which has given rise to a need for improved competence in managing open innovation. Flows of ideas across firm boundaries are central to open innovation and the knowledge is commonly associated with a set of registered or unregistered IP ownerships and rights such as patents, copyrights, trade secrets, licensing rights, which are allocated through managerial and legal decisions. Ensuring that each actor has sufficient freedom to operate and the IPRs required to support its business, is known as the IP assembly problem. The aspect of closing open innovation refers to the change process by which

organizations decrease their overall openness in innovation. Closing open innovation, also referred to as the IP disassembly problem, is the problem of detangling and allocating IP rights at the closing or termination of an open innovation project (Granstrand, Holgersson 2014). IP management has a role in the governance of open innovation systems and can mitigate IP disassembly problems. Properly developed IP management can decrease related transactions costs of open innovation as well as that management of the disassembly can enable increased exit opportunities and decreased transaction costs related to the disassembly (Holgersson 2012).

Fore-, side-, and post-ground knowledge generated by open innovation collaboration may become background knowledge for a subsequent project. Skillful management of the IP disassembly process can capture excess knowledge resources. This can lead to an organization accumulating knowledge and skills that can be leveraged in subsequent projects through licensing and collaboration agreements (Granstrand, Holgersson 2014). Companies working with new technologies may be more willing to conduct collaborative research than those working with older technologies as companies developing their existing technologies have more at stake by sharing background knowledge (Holgersson 2016). It is important that management, economic, legal, and technical experts are involved in drafting contracts and structuring deals for open innovation (Granstrand, Holgersson 2014). Companies that have established strong guidance systems find themselves more affected in selecting and working with external partners, which is increasingly a necessity for competitive success (Kanter 2008). Through strategic management of IP and knowledge flows from various sources, an IP base can be built by reassembling IP over several generations of projects. IP assembly and disassembly can be remade as a virtue in the form of a business model that leverages assembly and disassembly to build and capture knowledge resources (Granstrand, Holgersson 2014).

Protecting intellectual property would seem to be at odds with pursuing open innovation, however, this is not necessarily the case. Open innovation only suffers when capturing intellectual property becomes an end unto itself, as opposed to a means of enhancing value of innovation (Alexy, Criscuolo & Salter 2017). Though IPRs are assumed to aim to increase excludability, IP management can work to limit excludability and enable accessibility (open source, open innovation) proactively ensuring accessibility to promote cumulative innovation (Holgersson 2012). IP may facilitate collaborations and development activities as long as they are regulated appropriately. Thereby IP actually plays a rather vital role within open innovation. Instead of defense and being used as a preventive activity, it may be used in a controlling and regulating manner to secure possibilities risen from collaboration (Alexy, Criscuolo & Salter 2017).

The value of innovation is not only captured by monetary rewards when an IP right is sold or licensed, such thinking would eliminate benefits from possible collaborations and partnering arrangements that down the road could generate valuable further developments and second generation inventions. In fact, excessive patenting and overly stringent IP policies only prohibit company researchers from communicating with outsiders, making collaborators look

elsewhere. Intellectual property must be a vehicle for building and sustaining communities, not an automatic defense against all outsiders. To prosper in the transforming IP landscape, companies must find a balance between closed innovation programs and the creation of capabilities that can be shared through open programs (Alexy, Criscuolo & Salter 2017).

2.3.1.4 Licensing and Knowledge Sharing

Firms holding IPR can extract value by for example selling the right, licensing the right, using it as a vehicle for collaboration, or giving the right away (Fisher III & Oberholzer-Gee 2013). In-licensing of technology plays a part in the acquisition and creation of IP and out-licensing has a part in the exploitation and extraction of value from IP. Other aspects of knowledge sharing include joint ventures and collaborations through open innovation (see further section 2.3.1.3) (Holgersson 2012).

It is essential that IP products intended for licensing have real business value. While some firms can and do license individual patents, it is usually more effective to create and license an IP portfolio. Established companies, focusing on IP licensing, are well aware of this and strive to develop a cohesive strategy, which they then use to balance and drive their IP development process. They treat IP as a manageable asset and incorporate it into the business planning process. They align IP to corporate strategy and focus on managing the innovation and associated IP pipeline in a timely and efficient manner. In these mature and well established companies, patents are considered as a fundamental part of a firm's business development strategy, and are likely to create business opportunities. Such firms also balance their IP development process to ensure that proper strategic emphasis is given to the front end developments (Lynskey 2009).

Licensing is attractive for a firm when rival firms are more efficient or have resources and capabilities that a company itself is lacking (Fisher III & Oberholzer-Gee 2013). A firm can motivate licensing-in IP for example when the IP can be licensed for less than the development cost, when licensed IP can be used to increase the business value (and hence profits) of the firm's products or services, or when the firm wishes to avoid any litigation if the IP in question is owned by another (Lynskey 2009). Licensing the use of a trade secret is logistically more difficult than a patent due to the risk of the trade secret being released (Fisher III & Oberholzer-Gee 2013).

Licensing technology to rivals may give competition but at the same time reduce the competitors' incentives to innovate or for entrants to engage in R&D. If instead exercising significant market power with the help of strong IP rights, the value of the market as a whole can be undermined, which in turn hurts the dominant firm as well as the subordinate firms. Licensing IP might further help a firm to increase capacity or to argue the demand for its products (Fisher III & Oberholzer-Gee 2013).

Sales of IP is advantageous for both firm and society when the asset is more valuable in the hands of the new owner, such as when the seller lacks capacities in manufacturing or

marketing to fully exploit the asset. To benefit from selling IP and increase the cost of inventing around, companies may use a strategy to acquire patents not only for their core innovation but also for related and substitute products. Other methods include to offer partial disclosure of the invention in exchange for compensation such as buyer's stock, which is also a way of indicating the perceived value of the disclosed invention (Fisher III & Oberholzer-Gee 2013).

The value of IP assets can be enhanced in multiple ways by collaboration. One strategy for collaboration is by participation in standard setting organizations, which benefits the participating companies by increasing the value of products to customers. Other types of profitable collaborations with respect to IP are by involving developers of complementary products (Fisher III & Oberholzer-Gee 2013).

Donating IP may not be the most obvious strategy for value enhancement. The strategic reasons for donation include making information publicly available, thus reducing the risk for future holdups and potentially leading to faster scientific progress. Financially, disclosing information can signal company value and help obtain financing and talent. In general, partial sharing is superior to single minded exercises of market power as the collaborative process typically increase the market value as a whole (Fisher III & Oberholzer-Gee 2013).

2.3.2 Value Adding Aspects of IP Strategy

Formulation of strategy, as defined by Porter, is to understand and cope with competition (Porter 2008). IP has become an important source of competitive advantage as technological developments have been recognized for their importance for economic success and growth and IP management can be used to create competitive advantage (Holgerson 2012). IPR can help gain competitive advantage by providing temporary technological lead, protect brand names, and help form industry standard (Reitzig 2004). Competitive advantage allows for superior profitability and growth relative the industry average and the path to competitive advantage rests, ultimately, on strategy (Porter 2014).

Reviewing the literature, there are many aspects related to IP strategy that have been shown to contribute to the value or growth of a business. Strategic use of IPR can extract value by preventing potential rivals from offering identical or similar products or services, selling the right, licensing the right, using it as a vehicle for collaboration, or giving the right away (Fisher III & Oberholzer-Gee 2013). Having an integrated IP value chain also enables the strategic building of a targeted IP portfolio as well as it enables the identification of weaknesses and potential improvements in the IP offering (Lynskey 2009).

Actions from rival firms affect the value of IP, the value of the market, and the value of the market shares (Fisher III & Oberholzer-Gee 2013). IPR can be used to mutually exchange technology between players in the market or to obtain incumbency advantages for example by increasing level and concentration of patenting or by increasing switching costs. Incumbency advantage can also be turned into an entry barrier for followers. Further strategic use of IPRs is to keep a handle on suppliers by maintaining control of key IPRs in different segments of the

value chain (Reitzig 2004). Often though, sharing the value of IP is in the best interest of companies and society (Fisher III & Oberholzer-Gee 2013).

Corporate management's genuine and early involvement in the IP planning process is a success factor for high returns from innovation (Reitzig 2007). Firm success relies on proper patent management rather than quantity of rights (Holgersson 2012). Another aspect is the organizational structures related to implementation of an IP strategy. Organizational structures which allow for frequent and informal information exchange between senior IP executives, management committee, and board lead to higher performance. Further, organizational arrangements with clear cut rules about IP saves time and allow for efficient operation at functional levels (Reitzig 2007) as well as inspire higher levels of creativity leading to more breakthrough technology (Kanter 2008). An organizational structure where IP officers are included in top management decisions has been correlated to better IP management performance (Reitzig 2007).

Studies suggest that the increased collaboration, as the result of a strategic IP management approach, within a company could increase business growth. With enough collaboration between the IP department and with the management planning department and the information technology department, patent strategy making can contribute to the sales and business growth. Collaboration between concerned departments leads to that IP value can be expanded even further (Germeraad 2010), while poor integration between R&D, strategy, and legal functions is correlated to missed opportunities to create and exploit the value of IPR (Fisher III & Oberholzer-Gee 2013).

Strategic IP Management also adds value by being part of competitive advantage and competitive strategy and by mitigating IP disassembly problems, which enables increased exit opportunities and decreased transaction costs. Yet further value adding benefits include higher quality protection rather than quantity, decreasing transaction costs, better governance of resource distribution, increased exit opportunities, improved innovativeness, improved technological governance and accessibility, increased efficiency of interorganizational relationships, increased economic development, awareness of "where to file", reduced R&D costs, IPR commercialization and collaboration, blocking competitors and increasing their time to market, negotiation positions, and by giving rise to new innovations (Holgersson 2012).

2.3.3 Disadvantages of IP Strategy

A value adding aspect of IP strategy, that has been mentioned, is the strategic participation in standard setting organizations (Fisher III & Oberholzer-Gee 2013). A drawback to be mentioned in this context is that to have a patent included in a technology standard, the firm may (must in some jurisdictions) have to license the technology on reasonable terms to competitors (Fisher III & Oberholzer-Gee 2013; Somaya 2012). This means that firms may need to make tradeoffs in their patent strategies in order to create greater value in the marketplace (Somaya 2012). The gains of the increasing market value as a whole, however, typically exceed

the losses from being forced to license IP to competitors on less-than-profit-maximizing terms (Fisher III & Oberholzer-Gee 2013).

It has also been mentioned the importance for business growth to share strategies of different internal organizations, i.e. to integrate IP strategy with corporate strategy. The disadvantage that follows is that having an IP strategy that is not integrated, contribute to cannibalization and disturbance between the internal organizations and makes it difficult to make achievements as a whole organization, leading to stagnation and no growth (Tanaka 2013b).

Another aspect to be noted in this context, is that patent strategies incur organizational costs, especially the time and attention of key technical and management personnel (Somaya 2012).

2.4 Integrating IP Strategy and Corporate Strategy

One of the reasons firms fail to extract business value from IP is the misalignment between IP strategy and overall business strategy. To maximize the business value of IP, there is a need of alignment between the IP and business strategies (Lynskey 2009). The alignment between intellectual property and company strategy has become sophisticated and differentiated, suggesting that strategies for IP based competition will require management attention at all levels of the organization (Reitzig 2007). In addition, and well worth mentioning, is that sophisticated licensing companies, which have made it part of their entire business to optimize work relating to IP, treat IP as a manageable asset which they incorporate into the business planning process as a fundamental part of the business development strategy. IP is aligned to corporate strategy and managed in a timely and efficient manner. By integrating the IP value chain like these companies, an IP portfolio supporting the business objectives can be built (Lynskey 2009).

Whenever technological or intellectual resources are involved, IP management is at core for general management and IP strategies must be integrated with general corporate strategies (Holgersson 2012). To integrate the IP strategy, it should span the entire IP value chain of the organization (Reitzig 2007). The integrated value chain enables strategic building of a target IP portfolio and enables management to identify weaknesses in the IP offering and potentials for improvement (Lynskey 2009). By integrating IP strategies and business strategies during the strategy making process, IP activities contribute to the achievement of corporate strategy, which results in corporate business growth (Tanaka 2013b).

As mentioned, early involvement of top management as well as organizational structures allowing for information exchange between IP executives and top management, increases innovation performance (Reitzig 2007). Different types of IP need to be studied and treated together and the management of these need to be integrated in the design of business model, strategy definitions, and, operationally, the management needs to be integrated with the R&D. Many studies indicate the need to better integrate management of IP with the more general management, strategy, and business models. Working with IP separately from the rest of the company can result in a lack of strategic perspective and focus on single rights rather than

combining rights (Holgersson 2016). When it comes to for example patents, it has been shown that to obtain an expected patent portfolio, an enterprise has to first define the patent strategy based on the business strategy, R&D strategy, etc. (Tanaka 2013a).

When IPR becomes the subject for further business growth, IP strategy will be implemented on the direction of management planning, which will lead to IP activities being on a more mature and integrated level in the enterprise (Tanaka 2013a). When IP strategy is integrated with corporate strategy, IP activities can make a substantial contribution to corporate strategy (Tanaka 2013b).

However, to relate IP strategy to company strategy, several aspects of the IP situation need to be clarified to properly assess the competitive situation. Decision makers must know what the competitive landscape with respect to IPR looks like, what are proven, successful strategies for using IP at the corporate and business unit level, what role in the IP strategy should the board and executive committee take, what organizational structures support IP related strategies the most, what pitfalls should be avoided, and how do successful organizations manage the do's and don'ts of working with IP (both at corporate and business unit level) (Reitzig 2007).

The management planning department is responsible for defining its business domain and business strategy based on outside market environment together with internal resources, while it is expected that the IP department can provide proper information of competitors' technical potentiality and the technical competence of the enterprise (Tanaka 2013a).

Although the literature clearly indicates the benefits of strategic work, there are differences in maturity within companies when it comes to IP work and IP strategy. Studies show that integrated enterprises are rather good when it comes to IP strategy making for mid/long term basis, while non-integrated enterprises have a lack of IP strategy making (Tanaka 2013a). Though the possibilities IPR may present are not disputed, knowledge driven innovations are almost never based on one factor but on the convergence of several different factors and a meaningful progress occurs only after all the pieces are in place (Ryall 2013).

2.5 Value Adding Aspects of IP

Today, much of company value is within IP whereas 40 years ago the reverse was true. Ocean Tomos release in 2015 of the update to the Annual Study of Intangible Asset Market Value, also reported by Geoff Colvin of Fortune Magazine, reveals that intangible asset value of the S&P 500 (Standard & Poor's 500) grew to an average of 84% by January 1st, 2015, an increase of four percentage points over ten years, and from 17 % in 1975 to an astonishing 87% in 2015. Further, data from the US Department of Commerce, Bureau of Economic Analysis (BEA) confirms an increase stating that investments in intellectual property products (R&D spending including software), have grown at a rate of 9.6% (Stathis 2015).

The pace with which new technology based firms (NTBFs) can secure intellectual property rights (IPR) on novel products and processes is important in order to achieve not only legitimacy and external visibility, but to attract early finance, to obtain market share, and overall

to increase the likelihood of survival. IP helps support future revenue streams and enables barriers to competition. The quantity and quality of IP is closely related to a firm's perceived value in view of investors, partners etc. Patents, trademarks, and designs are for example considered assets on the balance sheet and thereby presents valuable ponds in the pursuit of a business (Lynskey 2009).

To be seriously considered by investors, founder entrepreneurs must prove ownership of the rights to the proprietary technology underlying their firms. Their success in attracting investment – public offering or private placement – hinges on convincing investors that they have obtained patents or patent licenses (from third parties) to protect the firm's products or processes, and that it can function without infringing the IP rights of others. Likewise, before the completion of any merger, acquisition, joint venture or licensing transaction, potential partners have to be satisfied with the risk of the potential transaction. A strong patent portfolio can create opportunities through licensing or act as a tool to leverage strategic alliances (Lynskey 2009).

There are even indications on a correlation between actual stock market value and size of IP portfolio. It has been suggested that an IP portfolio that is growing is related to increasing stock market value. Deng et al. (1999) have highlighted a significant positive relationship between the technological impact of patent portfolios, and the stock market valuation of firms owning the rights to these portfolios (Lynskey 2009).

IP, in the form of patents, may be used to block competitors from using a technology and thus increase the competitors cost and time for imitating, inventing around, or that they stay away from the market. It may also increase competitor willingness to pay for a license. Patents can also be used to ensure freedom to develop or design by blocking competitors from blocking oneself. Further benefits of patenting include: the creation of an identifiable asset that can be used in licensing, financing, cooperation, divestment, etc.; the creation of an asset that can be activated on the balance sheet; and the enablement of intra firm licensing for cross country transfer of profits (Holgersson 2012). Patents also contribute to increased profit margins for both small and large companies (Holgersson 2016).

Patent rights are also important as competitive means for the protection and commercial exploitation of new technologies. In light of the above, patent information is thereby important as a means for technology and competitor intelligence (Holgersson 2012). As such, patent information can be used for different kinds of forecasting, for example to forecast technical development and to asses technological strengths and weaknesses in a company. The most common reason to apply for a patent is to prevent imitation but is also used to avoid litigation, to improve positions in negotiations, to block other companies' research and patenting, and to improve the company's image in relation to external actors (Alexy, Criscuolo & Salter 2017). There are various means of appropriation and they are to be considered complements rather than substitutes. Despite the low appropriation effect, patents are motivated by protected innovations, prevention of imitation, its use to avoid trials, its use to achieve a strong negotiation position (for example in technology trade and avoiding information paradox), and its use to block other firms'

R&D and patenting efforts (Holgersson 2012). The overall benefits of patents thus include, providing a proprietary market advantage (shorter time to market) improving financial performance (reducing R&D expenditure); and improving overall competitiveness (Hussain 2016).

Intellectual property often facilitates or is even necessary for collaborative research and development activities. In general, intellectual property benefits open innovation when it's used more as a signaling device than as a control right. Having a patent allows an entrepreneur to improve his or her negotiations with venture capitalists, potential collaborators or large companies interested in buying the idea and shows third parties that the company that it has made an inventive step in a particular area (Alexy, Criscuolo & Salter 2017).

IPR is well known to present value for a company, some well-known examples presented by Forbes include, "Apple", the most valuable brand in 2016 with a value of 154.1 billion USD and generating brand revenue of 233.7 billion USD, and H&M, number 33 from a global perspective, but number 1 in Sweden, has a value of 15.9 billion USD and generating brand revenue of 21.5 billion USD (Forbes 2017). With regard to the value of patents, in 2014, Lenovo bought 21 patent families from Unwired Planet at a price of MUSD 4.7 per patent family (Kan 2014). Another valuable example is Pfizer's Lipitor, once the world's biggest selling drug, peaking at annual sales of more than \$9 billion and with lifetime sales of more than \$131 billion, due to exclusivity allowed by patents (Forbes 2013). All of the above disclose examples of IPR generating direct revenue. In fact, a patent can increase the values of an invention by 40-50% and is shown to have a positive effect on the price during the sales of a company (Holgersson 2016).

2.6 Disadvantages or Non-Value Adding Aspects of IP

Intellectual resources require time, money and effort to build and IPR is costly to enforce and transfer (Holgersson 2012). Patent related actions are generally expensive and resource intensive (Somaya 2012). A very small part of all patents are very valuable, while many patents are hardly worth anything. A question that has been discussed is which fraction of all existing patents that really are exploited? A recent study shows that 45% of the patents in the companies studied are not used in products, services, or processes but may instead be used for strategic reasons such as to block others or prevent invent arounds (Holgersson 2016). Building an IP portfolio can be a formidable expense for a start-up or early stage technology based firm operating on limited capital investment (Lynskey 2009).

A non-value adding aspect, or "not as high value added as would be possible" aspect presents itself in a study investigating collaboration with regard to IP matters within companies. This study implies that IP departments has collaborated with other departments regarding jobs on management by objectives, however IP activities which relate to traditional IP practices show low collaboration. The resulting low scores imply IP departments do not have enough collaboration in order to fully implement IP activities. If there is not enough collaboration with concerned departments, IP value cannot be expanded further (Tanaka 2013a). The same applies

to integration, namely, poor integration between R&D, strategy, and legal functions is correlated to missed opportunities to create and exploit the value of IP (Fisher III & Oberholzer-Gee 2013).

Another aspect, is that by looking into patent information, this can be used for different kinds of forecasting, for example to forecast technical development and to assess technological strengths and weaknesses in a company (competitors or own) (Holgersson 2016). While patenting provides the right, for a limited time, to exclude others from using the invention, this right is also associated with disclosure of the invention (Somaya 2012). Trade secrets, on the other hand, are not published but do not offer any protection if someone else patents or uses the invention (Holgersson 2012). This may be of specific relevance to many small firms which have problems with properly benefitting from the patent system, while large firms have increasingly developed their IP strategies and especially their patent strategies (Holgersson 2012).

2.6.1 Disadvantages of IP Related to Direct or Indirect Costs

One perspective found in the literature is that patents have little effectiveness in appropriation, drawbacks including competitors inventing around, information disclosure, and high economic and non-economic costs (costs including direct costs of writing, translating, filing, renewals, monitoring and enforcing, and the costs associated with information disclosure). Informal means of appropriation are considered more effective, such as sales or service efforts, market lead times, learning and cost reductions, secrecy, and switching costs. The main motive for patenting, many times, is to protect innovations and prevent imitations, though some less positive effects found may be that market lead time can for example be prolonged by patent or trade secret protection.

Building an IP portfolio, can, as previously mentioned, be a vast expense for a start-up or early stage technology based firm operating on limited capital investment (Lynskey 2009). Further, size is a key element in IP strategy. The size of a patent portfolio required to compete effectively varies by industry and segment. In for example a competitive pharmaceutical area, not being the sole holder of a drug patent may impede successful competition (Germeraad 2010).

Another challenge/disadvantage innovation intensive companies face, not exclusive to, but common to, pharmaceutical companies, are the revenue declines associated with the a patent cliff, i e the expiration of a high profit generating patent. This may be illustrated by the events Novartis faced in 2011 when their blockbuster drug Diovan, which accounted for more than 20% of the pharmaceutical division's revenue, 5 billion USD annually, had its European patent expire in the fall of 2011, and the corresponding US patent expiring the following year. This would correspond to an annual revenue decline of 4 billion USD (Jimenez 2012). To put this in perspective, IMS Health, a healthcare information provider, predicted that by 2016 patent expirations will have caused a loss of \$106 billion in sales from branded drugs over the previous five years, with the heaviest burden in 2012 and 2013. To cite the largest example, Pfizer's Lipitor, the best selling prescription drug in history, went off patent in 2011, and analysts expected Lipitor sales to decline from about \$11 billion in 2009 and 2010 to just above \$3 billion

in 2015 (Jimenez 2012).

Yet another challenge is the matter of pace, today, with globalization and speed of technical development, the advantage a company has one day is quickly gone the next. Since margins are decreasing, the IP licensing business is rapidly evolving in line with the demands of an expanding knowledge economy. It has been suggested in the literature that IP should be viewed as an activity similar to R&D and manufacturing which requires the attention and effort of founder entrepreneurs if it is to deliver products that have real business value. IP is thereby implied to be a time and resource consuming activity, in need of the appropriate attention and costs related thereto (Lynskey 2009).

2.6.2 Disadvantages of IP Related to Open Innovation

In addition to the above, the use of open innovation has grown during the past decade which has given rise to a need for improved competence in managing open innovation (Granstrand, Holgersson 2014).

Open innovation is a term frequently used today, and as previously mentioned, it only suffers in relation to IP, when capturing intellectual property becomes an end unto itself, as opposed to a means of enhancing value of innovation. In fact, excessive patenting and overly stringent IP policies only prohibit company researchers from communicating with outsiders, making collaborators look elsewhere (Alexy, Criscuolo & Salter 2017).

On this note, and in need of attention, are also the issues of assembling IP at the beginning of an open innovation initiative and the closing of open innovation at the end of an open innovation initiative. Closing of open innovation refers to the change process by which organizations decrease their overall openness in innovation. The IP disassembly problem is the problem of detangling and allocating IP rights at the closing or termination of an open innovation project. Flows of ideas across firm boundaries are central to open innovation and the knowledge is commonly associated with a set of registered or unregistered IP ownerships and rights such as patents, copyrights, trade secrets, or licensing rights, which are allocated through managerial and legal decisions. Ensuring that each actor has sufficient freedom to operate and the IPRs required to support its business, presents an IP assembly problem (Granstrand, Holgersson 2014).

2.7 Literature Findings and Hypothesis

Studying the literature, the importance of alignment between the IP strategy and the corporate strategy for business growth is highlighted by many researchers such as Lynskey, Fisher, and Holgersson, among others (Holgersson 2012; Lynskey 2009; Tanaka 2013b). IP has become an important source of competitive advantage due to the importance of technological developments for economic success and growth (Holgersson 2012).

In relation to the purpose of the thesis, not only the importance of alignment of IP strategy with corporate strategy but also its implications for increasing perceived company value have been studied. Increased company value can be achieved by business growth. Business

growth, in turn, has been shown to be achieved by strategic use of IPR in creation of competitive advantages and other means for value extraction such as sales, licensing, etc. (Fisher III & Oberholzer-Gee 2013; Holgersson 2012). In relation to actively extracting value from IPR, creating business growth, and thus, implying increased company value, top management involvement is essential (Reitzig 2007; Reitzig 2004). Business growth has further been suggested to be a result of increased collaboration across functional units (Germeraad 2010).

Other means for achieving increased company value can be reached by higher performance which, among other things, is related to organizational structures related to the implementation of IP strategies (Reitzig 2007). Thus, factors of strategic IP management that can be related to business growth have been found to be related to the ability to actively extract value from IP, top management involvement, cross-functional collaboration, and the IP awareness throughout the organizational structure.

As a result of reviewing and analyzing the literature with the purpose to investigate how a firm's alignment between its IP strategy and corporate strategy may influence value adding aspects of the firm, possible correlations between implementing an IP strategy into the business strategy and business value increase may be found. We therefore propose a research hypothesis that; alignment of IP strategy with corporate strategy can contribute to increasing the value of a company by increased collaboration, a more effective organization, increased quality or quantity of IP, and active use of a larger fraction of the IP assets for value extraction.

3. Method

According to Yin (2014) case study is the preferred method compared to other methods such as survey, experiments, and histories in situations where the main research questions are how and why, the researcher has little or no control of behavioral events, and where the focus of the study is a contemporary phenomenon. Since our hypothesis seeks to explain the present circumstances of how alignment of IP strategy with corporate strategy contributes to enhanced company value, this involves contemporary events rather than historical and therefore, conducting a case study is justified. The research question in relation to the hypothesis is thereby formulated as: how can integration of IP strategy into corporate strategy enhance firm value?

As mentioned by Yin (2014), case study evidence may come from six sources: documents, archival records, interviews, direct observation, participant observation, and physical artifacts. For this case study, evidence has been collected by using multiple sources of evidence such as structured literature reviews, questionnaires, and interviews with a number of technology based and IP intensive companies. Using multiple sources of evidence is one of the four overriding principles of high importance for the conduction of case study. Further, by presenting material in a structured theory building way, a chain of evidence may be discernable (Yin 2014).

Yin (2014) stresses the point of exercising care when using electronic sources of evidence. Electronic sources that have been used for this case study are article databases and journals with high credibility such as articles found in journals such as HBR, Research, Technology Management, and MIT Sloan Management Review, and relating to corporate strategies, IP strategies, as well as IP management.

The interviews serve in part to test the hypothesis that alignment of IP strategy and business strategy can enhance firm value by analyzation of the answers of the interviewed companies and in part to be used as a source for data triangulation to compare and correlate the findings from the literature reviews with the findings from the interviews. Data triangulation is mentioned as a major strength of the case study data collection as it aims to collect information from multiple sources aimed at corroborating the same finding, such that the case study's findings are supported by more than a single source of evidence (Yin 2014).

To assure spread between various industries such as to achieve a result that is not tied to a specific industry or sector but rather represents the strategic views and implications of IP in general, the companies selected for the interviews were chosen among technology based companies, to assure likelihood of presence of IP assets. The technical fields chosen were 1) IT, Software, Computers, and/or High-tech, 2) Mechanical engineering and/or Med-tech, and 3) Life-science, Bio-tech, and/or Pharma. A desired spread between the three technical fields chosen was defined to be at least 30% of the total response rate to assure representation of all chosen technological fields.

To achieve the desired spread among sectors and company sizes, the questions were sent to 30 companies. In total, 13 companies replied to the questionnaire and among those, three companies were within the field of IT, Software, Computers, and/or High-tech; six companies

were within the field of Life-science, Bio-tech, and/or Pharma; and four companies within the field of Mechanical engineering and/or Med-tech. Thereby the goal of at least 30% response rate from each field was not reached. The field of Life-science, Bio-tech, and Pharma represents a larger part of the responding companies and thus the indication of the results may be slightly influenced by any particularities of strategic IP choices in this sector.

Within the fields of IT, Software, Computers, and/or High Tech, and within the field of Life-science, Bio-tech, and/or Pharma there was a spread in size of the companies that answered. Both small incubator companies and SMEs, 5-50 employee companies as well as companies with more than 50 employees are represented. Within the field of Mechanical engineering and/or Med-tech we only received replies from large companies with more than 50 employees. Independently of technical field, we received replies from five large corporations, five medium sized companies (5-50 employees) and three small startups, thus with regard to company size there was a spread among the company size.

To avoid any bias among the interviewees the questions were asked using a predeveloped questionnaire (see appendix A). To assure that the answers would be comparable, the interviewees were given multiple choice answers to choose from for each question. As interviewees, top management, IP managers or R&D directors were chosen to assure that they had proper insight into the company and that the questions could be properly answered in an attempt to ensure validity and reliability in the results thereof.

The questionnaire was based on questions relating to the active use of IP assets, the managerial involvement, the collaboration with regard to IP and the IP awareness throughout the organizational structure, as these factors were found to be correlated to business value and growth in the literature review. In addition, some basic questions in relation to the company structure and their integration of IP strategy were composed, such that a distinction between the companies having and not having aligned business and IP strategies could be made.

Some of the information may be perceived by the individual companies as confidential, and some of the interview subjects have put forth a wish to be anonymous, why data and results presented in this report are not linked to any specific company.

Another of Yin's overriding principles is to store data in a case study database (Yin 2014). For this case study, a case study database was created for storing all collected data from the literature reviews and interviews into organized folders.

To maintain the chain of evidence, the last overriding principle discussed by Yin (2014), the data and evidence needed would need to be collected in part from existing theories and in part from finding evidence among real companies. This has led to the research question as stated with the intention to collect data that provides answers to not just that it is beneficial to align IP strategy with business strategy by as how these benefits take shape and which the influential factors are. The documentation from the literature reviews will thereby provide formal studies and evaluations of topics related to our research question. Interviews and questionnaires will provide targeted information specifically related to the current topic, and from specific

companies/persons of interest as well as give insight into the reality of creating IP and corporate strategies. The combination of documents and interviews will, as mentioned, be used to triangulate the data and to relate the literature to the reality and to reduce possible bias in either of the sources. Through analyzation of the documentation and the questionnaires and interviews, a conclusion about how integration of IP strategy into corporate strategy can enhance company value can be drawn.

4. Empirical Findings

The factors of strategic IP management that can be related to business growth have been found to be related to the ability to actively extract value from IP, top management involvement, cross-functional collaboration, and the IP awareness throughout the organizational structure. Thus, these factors, and their variance between companies having or not having an IP strategy aligned with the corporate strategy were investigated to find the correlation between increased company value and aligning the IP and overall business strategies. The results of this investigation are presented below.

In relation to managerial involvement, the results from the interviews show that 58% of the interviewed companies have an IP strategy and only 57% of these (i.e. 33% of the total) have actively integrated their IP strategy with the corporate strategy. For all of the companies where the strategy has been aligned with the corporate strategy, the initiative has come from the management.

In general, the larger companies (both with respect to size and IP assets) are more prone to have an IP strategy than the smaller companies. Reasons for not having an IP strategy include not having gotten around to it, being a small company or cost reasons. Reasons for not aligning the IP strategy with the corporate strategy include perceived lack of competence or not being aware of the benefits of aligning the strategies.

With regard to the IP awareness throughout the organizational structure, all companies, with one exception, consider the IP awareness in the company to have increased during the last 5 years, which is in alignment with Reitzig's theories on the increasing importance of IP (Reitzig 2007).

With regard to cross-functional collaboration, the companies with integrated IP strategy indicate a higher level of collaboration in general across functional units. 100% of the firms with an integrated IP strategy indicated that they had high collaboration across all functional units. Among the companies without integrated IP strategy, only 25% indicated high collaboration across the functional units while 63% indicated that the collaboration was high, but only within the own functional unit. 13% of the firms without IP strategy indicated that their firm was characterized by high specialization and little collaboration both within and across functional units, see figure 4.1.



Figure 4.1. Self-rated assessment of the collaboration with regard to organizational structure. “A” represents companies lacking integrated IP strategy and “B” represents companies with integrated IP strategy.

The companies with integrated IP strategy also indicate higher collaboration with respect to IP related issues across functional units (in comparison to collaboration in general as above) than do companies without an integrated IP strategy. When asked to rate the cross-functional collaboration with respect to IP from poor to excellent, 50% of the interviewed companies with an integrated IP strategy consider the collaboration to be excellent and 50% consider the collaboration to be good. Among the companies without an integrated IP strategy, 60% considered the collaboration as poor and only 20% considered the collaboration as good or excellent.

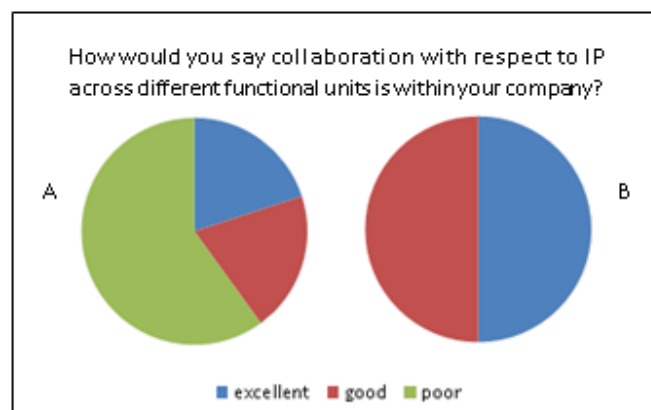


Figure 4.2. Self-rated assessment of the collaboration with respect to IP across functional units. “A” represents companies lacking integrated IP strategy and “B” represents companies with integrated IP strategy.

On the aspect of active use of IPR, companies with an IP strategy aligned with the business strategy, self-rate a higher fraction of active use of their registered IPR, see figure 4.3. Out of the companies with an integrated IP strategy, 50% self-rate that more than 50% of their IPR is actively used and 50% self-rate that 10%-50% of their IPR is actively used. Looking at the companies without an integrated IP strategy, 67% self-rate that less than 10% of their IPR is actively used and 33% self-rate that 10%-50% of their IPR is actively used.

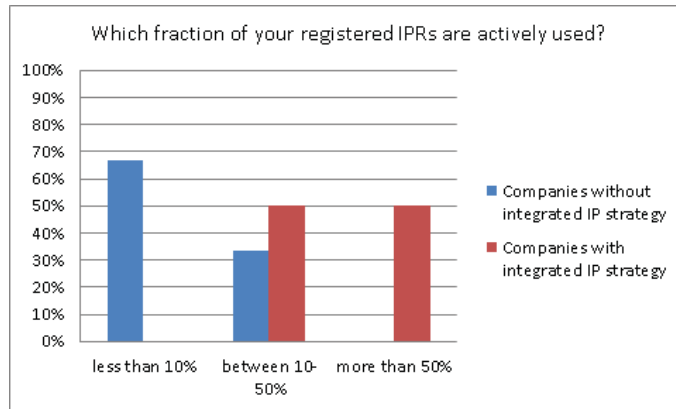


Figure 4.3. Self-rated assessment of the fraction of IPRs that are actively used.

5. Analysis

Based on the empirical findings, the aspects of strategic IP management indicated by the literature review to contribute to business growth, were found to a higher extent in the companies that indicated that their IP strategies and business strategies were aligned.

It has been shown that to maximize the business value of IP, alignment between business strategy and IP strategy is needed. Why then is there is a lack of implementation of IP strategy into the business strategy in the real business situation and a lack of integration between IP and other functional departments? Out of the interviewed companies only 33% report to have actively aligned their IP strategy with the overall business strategy. According to the literature, and supported by the interviews, the failure to extract business value from IP is often due to under appreciation of importance, concepts and tactics of IP, absence of internal processes to extract, evaluate and capitalize IP, insufficient or unreliable knowledge of competitive IP, and misalignment between IP strategy and overall business strategy. In the interviews, reasons mentioned for not having aligned the IP and business strategy are lack of competence or not being aware of the benefits of aligning the respective strategies. Not having the ability to actively extract value from IP indicates a missed opportunity for business growth. From the interviews it can be deduced that those companies that have aligned their respective strategies also have a higher active use of their IP assets, which indicated that they are better at extracting value from IP which contributes to their business's growth.

One of the factors found to be related to business growth by the strategic management of IP is the essential involvement from top management. Top management involvement in IP strategy has been shown to be associated with better IP performance, which is also supported by the interviews in that when the companies have aligned their IP strategy with their business strategy, the initiative for alignment has been taken by the management. Though there is no single optimal approach for all firms, corporate managements genuine involvement in IP related projects has been shown to be a success factor for driving IP performance, and thus business performance. The active use of IP for exploiting its value by for example licensing deals, collaborations, negotiations, enforcement or improved competitiveness of IPR is also one of the factors related to business growth that is, as mentioned, found to be higher among the companies with an integrated IP strategy than those without an integrated IP strategy. It is further higher among the companies with a higher level of top management involvement and the two factors can thus be correlated to each other, i e a higher level of management involvement leads to a higher level of actively used IP assets and thus increased business growth and thereby increased company value.

Another aspect found to be related to business growth, related to the strategic management of IP, is the cross-functional collaboration. Strategic and aligned IP strategy is suggested to improve the collaboration across functional units of a firm. The companies with integrated IP strategy indicate a higher level of collaboration across functional units as well as higher collaboration with respect to IP than do companies without an integrated IP strategy.

Integration between different functionalities, achieved by high collaboration, provide better opportunities for deploying IP which reflects the market demand, opportunities, and which is in alignment with the strategic vision of the firm, resulting in business growth and better exploitation of IP value.

Finally, IP management skills are also associated with increased efficiency both in the internal and in the external organizational relationships and thus related to increased innovativeness and economic development. The companies indicating alignment of IP strategy with corporate strategy show increased organizational awareness of IP and thus increased organizational efficiency which indicates the potential of increased business growth and thereby increased perceived value.

6. Conclusions and Implications

The purpose of the thesis was stated as to investigate the role that integrating a firm's IP strategy with its business strategy may play in influencing the firm's resource efficiency, perceived value, and IP value extraction, with the question of research being how can integrating IP strategy into corporate strategy enhance firm value?

Based on the literature studies and the interviews, three main factors enhancing firm value by positively influencing resource efficiency, perceived value, and IP value extraction, resulting from the alignment of IP strategy and corporate strategy, have been identified. These factors are management involvement, internal and external collaboration, and organizational IP awareness.

Firstly, management involvement reflects the importance of IP for the organization. This importance is thereby reflected throughout the organization, leading to an understanding of the importance of IP in the respective functional units. Top management's involvement in IP strategy has been shown to be associated with better IP performance, which is also supported by the interviews in that the companies that have aligned their IP strategy with their business strategy, the initiative for alignment has been taken by the management. This further indicates the management's direct involvement in the company's IPRs and IP strategy for those companies. Management involvement further ensures that the vision and strategic goals are common for the company as a whole, and, in relation to IP, ensures that the IP pursued reflects the market demand and opportunities as defined by the overall strategy. Pursuing IP in alignment with the strategic vision of the firm has been shown by Fisher and Lynskey to result in business growth and better exploitation of IP value. Further, based on the interviews, management involvement and IP strategy alignment results in more active use of IP assets.

Active use of IP assets have been shown by, among others, Fisher, Holgersson, and Granstrand to contribute with value, directly or indirectly, through for example licensing deals, sales, collaborations, negotiations, enforcement, or improved competitiveness. Relating this further to the interviewed companies, the active use of companies' IPR, resulting in exploitation of IP value such as mentioned, is higher among the companies with an integrated IP strategy than those without integrated IP strategy. This may indicate that those without integrated IP strategy have untapped value to tap into, which could be aided by a clearly defined and integrated IP strategy.

Though the value generated from the active use of IP assets has not been analyzed in the interviews, the literature indicates that strategic and active use of IP provides value by providing a competitive advantage, improving negotiation positions, or direct revenues by sales, licensing or enforcement, thus contributing directly or indirectly to increased value.

Increased collaboration arising as a consequence of alignment of IP strategy and corporate strategy is noted in the interviews. Collaboration and business growth has been shown to correlate by for example Tanaka. Benefits from collaboration include earlier interaction between different functional units, which leads to ideas spreading across units and firm

boundaries. The spreading of ideas thereby giving rise to new inventions and further that these inventions are in alignment with the strategic vision of the firm, thus providing better opportunities for deploying IP reflecting the market demand, business opportunities, and resulting in business growth as well as the direct and indirect value benefits of better exploited IP value, e.g. by sales, licensing, collaborations, etc. as mentioned above. Collaborations giving rise to new inventions also means that the number of inventions can increase. The quality of the IP pursued can be increased by the interaction between the departments based on shared strategic visions assuring that only IP reflecting the strategic vision of the firm are pursued.

In relation to the organizational structure and IP awareness, organizational arrangements with clear cut rules about IP saves time and allows for efficient operation, thus indicating a cost reduction in the form of increased resource efficiency. Clear cut rules have also been shown by Kanter to inspire higher levels of creativity, leading to more break-through technology, the benefit thus implied is increased innovativeness and increased speed or quantity of innovations.

In conclusion, making IP strategy part of the business plans and overall company strategy results in management involvement providing shared visions and clear cut rules, increased organizational IP awareness, and cross-functional collaboration, which can enhance perceived value of a company by means of increased resource efficiency, increased innovativeness, higher quantity or quality (whichever is desired by the strategy) of IP, and active use of a higher fraction of IP assets.

7. Further Studies

This investigation has been performed thoroughly, to the best of our knowledge, however, in order to strengthen the results further, as a next step, interviews with a larger number of companies could be performed. Also, it might be of interest to include companies from other parts of Europe and possibly all over the world to see if also those data align with the hypothesis according to this investigation or if there are differences from a global perspective.

Another area worth looking into could be regarding the magnitude of the value increase. Then it would be necessary to first define what points of measure could be applied. This might open up for more detailed questions regarding number of rights and/or perhaps a scale allowing to grade importance of different IPRs.

The chain of evidence presented by the literature review was indeed confirmed in the interviews performed. This investigation has however, as mentioned, opened up for some further interesting questions that could be open for future investigations. One such topic may comprise how firms can increase amount of and pace of innovations. We touched briefly on innovations in chapter 1.4 “delimitations”. Since innovations may be more difficult to measure, the questions relating to this would likely need a somewhat different approach than the present investigation. For companies within cultural disciplines and perhaps the public sector, an increased innovational climate may be of interest, since value increase cannot easily be achieved by increased number of inventions or increased quality of the same, for these companies. This would of course not necessarily exclude technology based and IP intensive companies, such as the once investigated herein, from such an investigation, however the line of questioning would need a somewhat different approach. The main question could then be along the line of if making innovation strategy part of the business plans and overall company strategy could enhance perceived value of a company.

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Appendix A

The questionnaire below presents the multiple choice questions used in the interviews performed in light of this thesis.

Title: IP Value Questionnaire for Thesis Investigation.

All answers will be handled with confidentiality and no names will be displayed.

Company name:

(Optional to answer)

1) What technical field is the company within?

- Life-science/Bio-tech/Pharma
- IT/Software/Computer/High-tech
- Mechanical engineering/Med-tech
- Services

2) What size is your company (self-rating)?

- 1 person incubator company or SME
- 2-5 person SME
- 6-50 established company
- more than 50 employees

3) How many registrable (patent/trademark/design) rights do you have?

- 1-3
- 4-10
- 11-50

4) Does your company have a yearly IP budget?

- No
- Yes between 0 -10 000 EUR
- Yes between 10 000 -50 000 EUR

5) What characterizes the organizational structure of your firm?

- high collaboration across all functional units, all employees have a good knowledge about what others do.
- high collaboration within single units, employees have a good knowledge about what others do within the functional unit.
- low collaboration, high specialization, all employees are really good at their individual contribution.

6) Does your company have an IP strategy? If yes, proceed to question No 7-15; if No, proceed to question No 16-20.

- Yes
- No

7) If yes, has it been integrated with the business plan of your company? If no, proceed to question number 16-20.

- Yes
- No

8) If yes, was the integration initiated by R&D, management, IP department or other such as marketing/HR?

- R&D
- Management
- IP department

9) If yes, was there a need for a change in the organizational structure to fully integrate the IP strategy with the business plan?

- Yes
- No

10) If yes, has the amount of registrable rights, post IP strategy integration, changed?

- Increased
- Decreased
- No change

11) If yes, has the quality of registrable rights, post IP strategy integration, changed?

- Increased
- Decreased
- No change

12) If yes, has the perceived value of the firm, post IP strategy integration, changed?

- Increased
- Decreased
- No change

13) If yes, how would you say IP awareness is within your company?

- Increased
- Decreased
- No change

14) If yes, how would you say collaboration with respect to IP across different functional units is within your company?

- Poor
- Good
- Excellent

15) If yes, which fraction of your registered IPRs is actively used?

- more than 10%
- between 10-50%
- more than 50%

16) If no, why?

- I/we don't see a reason for an IP strategy or integrating the existing IP strategy with the business plan
- Too expensive to create and implement
- Other

17) If no, how does the amount of registrable rights change on a yearly basis?

- Increased
- Decreased
- No change

18) If no, how would you say IP awareness is within your company (past 5 years)?

- Increased
- Decreased
- No change

19) If no, which fraction of your registered IPRs is actively used?

- less than 10%
- between 10-50%
- more than 50%

20) If no, how would you say collaboration with respect to IP across different functional units is within your company?

- poor
- good
- excellent

Feel free to add any further comments: