



CHALMERS
UNIVERSITY OF TECHNOLOGY

AI's Impact on Companies' Intellectual Property Strategies

A Qualitative Study on how the Technological Shift of AI
Impacts Creation and Management of Intellectual Properties

Bachelor's thesis in Industrial Economy

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CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2025
www.chalmers.se
Bachelor's Thesis TEKX18-25-03

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AI:s påverkan på företags strategier för immateriella tillgångar

En kvalitativ studie om hur teknikskiftet med AI påverkar skapandet och hanterandet av immateriella tillgångar

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SUMMARY

Problem

There is an ongoing technological shift driven by artificial intelligence (AI), making machines more human-like, in abilities such as problem solving and creation of new works. Prior research has identified that AI is a potential source of change in the field of intellectual property (IP) and IP strategy. The technological shift might already have changed the environment for companies and may further impact the companies' work with IP and IP strategy. Although previous studies have acknowledged this impact regarding AI and IP, there is a lack of qualitative studies exploring how this technological change has affected or will affect companies' work with IP or their IP strategies.

Aim

This study aims to explore, analyze and understand whether companies' work with securing intellectual property rights (IPRs) and their IP strategies has been, or is expected to be, affected by the technological shift with AI. Further, this study intends to create a better understanding of how technology interacts with the legal field when companies strive to stay competitive.

Theoretical Framework

The theory fundamentally describes the technological shift of AI as of today. Moreover, the theory includes the field of innovation, IP, IPRs and IP strategy as well as the intersection of AI and IP.

Method

The study used a qualitative method with an abductive approach. The data was collected through semi-structured interviews with 20 respondents, selected through analysis and ranking of research and development (R&D) heavy companies operating in Sweden. Further, the interview data was transcribed and analyzed using coding.

Results and Implications

The findings indicate that, so far, the companies' IP strategies have not yet been directly impacted by the technological shift of AI. The companies' IP strategies are closely linked to the overall business strategies, which have not yet been impacted by the technological shift of AI. However, the findings can be divided into operational, legal and strategical changes. Legally, the changes are primarily connected to the change of the IP landscape. Operationally, companies have started to automate some day-to-day tasks. Strategically, AI has for some made collaborations more complicated, some companies find trade secrets more valuable now and there are also concerns regarding decreased entry barriers.

The study also highlights potential future opportunities and challenges. Future opportunities include increased efficiency, cost reductions and enhanced strategic flexibility. Expected future challenges include legal uncertainty regarding the protection of AI-generated works, a growing number of patents that make the definition of prior art more complicated, and the increasing threat of patent trolls. The challenges may necessitate more advanced and adaptive IP strategies, suggesting potential for significant changes within the area of AI and IP.

Keywords: Intellectual property, intellectual property strategy, business strategy, artificial intelligence, innovation process

Note: The report is written in English.

SAMMANFATTNING

Problem

Det pågår just nu ett teknologiskt skifte kring artificiell intelligens (AI) där maskiner blir alltmer lika människor. Dessa maskiner har förmågan att lösa problem och generera nya verk. Tidigare forskning har identifierat AI som en potentiell källa för förändring kring immateriella tillgångar (IP) och IP-strategi. Teknikskiftet kan redan ha påverkat företags omgivning och kan påverkas ytterligare gällande IP och IP-strategi. Trots att tidigare studier har bekräftat AI:s inverkan på IP finns ett gap av kvalitativa studier som undersöker hur denna teknologiska förändring har påverkat eller kommer påverka företags arbete med IP och IP-strategi.

Syfte

Studien syftar till att undersöka, analysera och förstå huruvida företags arbete med att skydda sina IP och immateriella rättigheter (IPRs) har påverkats eller förväntas påverkas av teknikskiftet AI. Studien förväntas skapa en djupare förståelse för hur teknologi interagerar med den juridiska aspekten när företag strävar efter att bibehålla konkurrenskraft.

Teoretiskt Ramverk

Det teoretiska ramverket beskriver hur teknikskiftet AI ser ut idag. Dessutom inkluderas områden som innovation, IP, IPRs, strategi för immateriella tillgångar samt integrationen av AI och IP.

Metod

Studien genomfördes med hjälp av en kvalitativ undersökning med en abduktiv forskningsstrategi. Den empiriska datan samlades in genom semi-strukturerade intervjuer där 20 respondenter deltog. Urvalet baserades på en rankinglista över företag som är verksamma inom Sverige och som satsat på FoU. Intervjuerna transkriberades och analyserades därefter med hjälp av kodning.

Resultat och Implikationer

Resultatet visar på att företagens IP-strategier inte har påverkats explicit av teknikskiftet AI. Företags IP-strategier är tydligt sammankopplade med den övergripande affärsmodellen, vilket ännu inte har påverkats av teknikskiftet AI. Det är samtidigt tydligt att resultatet kan delas upp i operativa, juridiska och strategiska aspekter. Gällande operativt perspektiv har flera företag automatiserat delar av vissa IP-processer. Den juridiska aspekten är tydligt

kopplad till förändringen av IP-landskapet och osäkerheten kring vissa regleringar. Gällande det strategiska perspektivet har AI försvårat samarbeten för vissa företag. Dessutom anser vissa respondenter att företagshemligheter är viktigare nu och det finns även oro för lägre inträdesbarriärer på marknaden.

Studien belyser även potentiella möjligheter och utmaningar i framtiden i samband med teknikskiftet AI. Framtida möjligheter inkluderar ökad effektivitet, reducerade kostnader och förbättrad strategisk flexibilitet. Framtida utmaningar inkluderar juridiska osäkerheter gällande skydd och ägande av AI-genererade verk, en ökad volym av patent som försvårar definitionen av tidigare kända verk samt ökat hot av patenntroll. Utmaningarna kan kräva mer avancerade och adaptiva IP-strategier, vilket tyder på potentiella förändringar inom en snar framtid gällande AI och IP.

Nyckelord: Immateriella tillgångar, strategier för immateriella tillgångar, affärsstrategi, artificiell intelligens, innovationsprocess

Notera: Rapporten är skriven på engelska.

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1. Introduction

The introduction outlines the background, purpose, research questions, methodology and limitations of the study.

1.1 Background

The world is currently experiencing a technological shift driven by artificial intelligence (AI), where the use of AI has increased significantly in recent years. According to Statista (2024), the usage of AI among organizations globally has grown from 20% in 2017 to 72% in 2024, demonstrating that AI has evolved from a trend into an important tool. The advancement of AI has enabled machines and computers to better mimic human behavior and cognitive abilities (Bäck, 2023). Moreover, AI is defined both as a tool assisting in daily tasks in businesses as well as a potential part of value offerings (Bughin, et al., 2017). Despite these advancements, AI is still under development. A study from PwC (2017) demonstrates that the further development of AI can lead to the global GDP becoming 14% higher by the year 2030. They suggest that AI is the biggest commercial opportunity in today's economy, which describes the undeniable impact this technological shift may have as AI solutions become increasingly integrated into global business operations.

At the same time, companies have come to view intellectual property (IP) not only as a legal matter, but as a strategic tool in business development (Wang et al., 2015). IPs can be protected by different legal rights such as patents, copyrights, design rights, trademark rights and trade secrets. The intellectual property rights (IPRs) create opportunities and possibilities for companies to secure their inventions and capture the value of them when commercializing. When companies aim to capture the most value from their inventions it creates a need for a strategy to handle the IPs (Granstrand & Holgersson, 2015). As a result of technological change, such as technological shifts, companies' environments are changing which results in a growing need for clear IP strategies that adapt to technological change and new market conditions (Granstrand & Holgersson, 2018).

Prior studies describe how the legislation and rules regarding IP have changed in the past as a consequence of technological shifts. AI is described as a potential source of change for how IP works and will work in the long-term perspective. The possibility of generating and creating new works creates demand for changes and new regulations regarding the handling of copyright, patents and ownership (PRV, 2021).

Since the previous technological shift with digitalization affected companies' IP strategies, as discussed by Granstrand and Holgersson (2018), it is reasonable to assume that the ongoing shift with AI may have a similar impact. They highlight how the changes in the landscape and complexity of IP evolved, particularly through the emergence of new forms of collaboration between actors across different industries. Businesses were forced to develop new ways of protecting and sharing intellectual assets, primarily in collaborations where technologies and innovations are shared across organization lines. Companies that failed to update their strategies have risked losing their competitive position in the market.

Further, Holgersson et al. (2024) describe how AI has affected processes of open innovation. They conclude that both collaborations between companies and business models are affected

as a consequence of AI development. The way IP evolves during technological shifts is described as dynamic, which urges further studies regarding IP and strategies within IP related to technology.

There are also other studies that describe AI's effects on innovation and IP. Kazimi and Thalwal (2024) have studied how copyright, trademarks and patents are affected by AI and machine learning. They describe how the interaction between technology and law is central to technological development and that the IP system is constantly changing. Moreover, they also write that future development of strategies within IP should be studied based on the technological development that is constantly taking place.

Thus, the current technological shift with AI affects everything from the actual development of new rules for IP rights to the system for managing IPs, which sets the framework for innovative companies, creating both opportunities and challenges. Based on past research, the technological shift of AI is a potential source of change in the legal work regarding IP and IP strategy. The focus of this study will be if the technological shift with AI has affected IP and IP strategies. As noted by Holgersson and Grandstrand (2018), digitalization serves as an example of how a technological change can influence IP and IP strategies, however, this study will not draw any further comparison between digitalization and the current AI-driven shift.

There are different theories concerning IP and IP strategy's importance for companies. One theory is the Resource Based View which describes how companies' assets are viewed as strategic resources, developed by Barney (1991). Barney's perspective describes that there is a strategic value to a company's internally developed assets, such as IP, when the landscape for IP changes. When in a changing environment this value is important to handle effectively from a competitive perspective and the theory can therefore be considered useful for studies on changes within IP and IP strategy. Teece et al. (1997) also write that companies need to possess the ability to adapt their resources when conditions change, which underlines the relevance of the change of IP during technological shifts such as the current one with AI.

According to an article published in NyTeknik by Burrau (2025), AI might create possibilities that can enhance companies' abilities to capture value, streamline their operational work with IP, specifically with patents, and diminish costs. These are all of interest for a company striving to be competitive. Moreover, for companies it is relevant to understand how the management of IPs and IP strategy change as a consequence of the technological shift while striving towards competitiveness and securing market position. There is therefore reason to investigate and study whether changes in IP strategy can be identified as a result of today's technological shift with AI.

Furthermore, studies and surveys have shown that AI has an impact on innovation and IP, but qualitative impacts for companies by the technological shift of AI, as of today or in the near future, have not yet been studied. There is thus a knowledge gap as to how companies have been or may be affected by the technological shift with AI regarding their work with IP and IP strategy. This gap creates potential for research in the field of AI and IP. Potentially there are several aspects changing for companies, some of which might be beneficial and others challenging for companies. Based on where the technological shift is today and the extent to which the companies have implemented AI the changes may differ, however the field should be of interest to companies since the environment in which they are in is changing as a result

of the technological shift. It is therefore important for companies to understand how their IPs and IP strategy have changed and might change in the future.

1.2 Purpose

The ongoing technological shift with AI potentially influences companies' work and strategy regarding protecting IPs. For businesses handling IPs it is central to maintain competitiveness in the business' specific area. Since the application of artificial intelligence in businesses is ongoing, it is of interest to investigate if the work with IP and IP strategies currently has changed due to the emerging technology. The purpose of the study is therefore to explore, analyze and understand whether companies' work with securing IPRs and IP strategies has been, or is expected to be, affected by the technological shift with AI. This is done in order to create a better understanding of how technology interacts with the law while companies strive to maintain competitiveness and market positions. This study may serve as a valuable resource for companies seeking to navigate through these technological changes in present time as well as providing guidance regarding how they can prepare for future developments.

1.3 Research Questions

- Has the technological shift with AI affected the IP strategies of R&D-heavy companies operating in Sweden?
 - If so, how has the technological shift with AI affected companies' IP strategies?
- What challenges and opportunities can be identified within IP and IP strategy for R&D-heavy companies operating in Sweden as a consequence of the technological shift with AI?

1.4 Limitations

During the problem analysis a limitation was made to solely focus on large and established companies having business in Sweden, as well as investments in R&D. The study focuses on the current and emerging shift with AI which has occurred over the past five to ten years and due to this time perspective, startups are excluded. They have most likely not been around long enough to contribute and provide insights regarding how their work with IP and their IP strategies have changed during this period of time.

Large companies are often active globally and have international IP strategies. Therefore, it is not considered necessary to restrict the study to either international principles, general IP strategies or national level IP strategies. The report will mainly focus on the company's work regarding IP and if IP strategies have changed as of now in the technological shift of AI. Some future possibilities and challenges regarding IP and IP strategies will be explored but a detailed exploration of future scenarios is beyond the scope.

2. Methodology

In this section, the methodology of the study is described. The subsections present the method of choice, theoretical framework, data collection and data analysis, which describe the process in depth.

2.1 Method of Choice

When conducting a scientific study, either a quantitative or a qualitative methodology can be chosen. A study does not have to be strictly quantitative or qualitative, though, but can be a blend of these. A quantitative study aims to primarily test a theory through data collection, often numerical in nature, to then use the data to quantify and measure different effects (Bryman, 2016). This methodology has a so-called *deductive* research strategy, where a theoretical framework leads to a hypothesis which is then tested through a quantitative empirical study to be either validated or discarded. This can be contrasted with the qualitative research methodology where the strategy is instead said to be *inductive* (Bryman, 2016). An inductive strategy entails that theory is primarily conceived as a result of the empirical study, which in turn can be achieved through an iterative process where the results lead to a re-evaluation of the theory and so on. This differs from the more linear process that is associated with quantitative research. An *abductive* research strategy is similar to the inductive one but presses the importance of grounding the empirical observations in an established understanding of the research objects (Bryman, 2016).

For this study, a qualitative methodology was chosen, since the aim was to research how the technological shift of AI could impact companies' IP strategy. The choice of methodology was due to the open nature of the research questions, which necessitated a nuanced study. The majority of the study was conducted as a multiple case study in the form of semi-structured interviews with respondents working with IP and IP strategy. Aside from the case study, relevant literature was studied with the purpose of creating a theoretical framework. The respondents hence constitute the primary data, while the theoretical framework, which is based on secondary data, supports the discussion on the primary data. Together, these enable nuanced analysis and discussion. The research strategy was, hence, abductive, since the empirical results from the interviews were analyzed with the help of the literature, and lead to the study's conclusion through an iterative process.

2.2 Conceptual Framework

In the beginning stages of the study, before interviews were conducted, relevant literature was read to establish a theoretical framework and theoretical background for the subject. Since the study utilizes an abductive strategy, the theoretical framework was important for understanding the respondents and their work with IP, as well as how AI could impact this. The reading of literature was hence primarily done with the aim of putting the interviews in a theoretical context, by reading scientific articles relating to subjects such as IP, IP strategy and AI. The literature reading was also conducted to help form relevant interview guides and to achieve a better dialogue with the interviewees. It also aided in the analysis of the interview results and in writing the background of this report.

Moreover, new scientific articles were added during the interview process and in the coding stage in order to deepen the understanding of AI's role within IP. This enabled a better understanding of the result as well as connecting the result to the theoretical framework. The literature was retrieved through the database Scopus with the tool Scopus AI as well as articles given by our mentor.

2.3 Data Collection

The data collection and the primary data were collected by a multiple case study, where interviews were conducted in a semi-structured way. A qualitative study enables a nuanced and profound analysis of how or even if IP strategies have been affected by AI and how companies handle the technological shift in the case of an actual change in their strategy. In a qualitative study, the focus lies on the interviewee's point of view and allows the interview process to be flexible (Bell et al., 2022). In particular, a semi-structured interview enables the respondent to talk freely about the topics where the interviewer can ask follow-up questions in order to elaborate the answers and deepen the conversation (Bell et al., 2022).

The advantages of this approach are that the respondents receive the same framework to talk freely about, while every interview becomes unique and may contribute to a nuanced discussion. This method, as opposed to a quantitative method, is best suited to answer the purpose and the research questions of the study since there is no simple answer to how companies manage the technological shift or how it affects their IP strategies. A quantitative method usually results in unambiguous answers without any further elaboration or explanation, which does not meet the criteria to answer the purpose and research questions.

The disadvantages of this approach are that the result might not be clear if the questions in the interview guide are not well formulated or if they do not examine the problem definition well enough. The result might also be unclear if the interviewer does not ask the right follow-up questions or if the respondents misinterpret the questions. To avoid this, the questions were designed to examine the purpose and problem definition in several dimensions. The respondents were also asked to give examples of how and when they experienced any changes in their IP strategies connecting to the technological shift AI, as well as why they did not experience any changes.

The study's method enabled the respondents to talk freely about the study's main themes, IP and IP strategy, AI and IP, and opportunities as well as challenges within the field of AI and IP. Some respondents had many aspects to elaborate on, while others had not. This resulted in some interviews being more useful than others, depending on what follow-up questions were asked and how well the respondents could answer the questions in the interview guide. However, all interviews contributed to the findings and made it possible to answer the study's purpose and research questions. When the results were compiled, and if anything remained unclear, the respondents were contacted via email for clarification.

By adhering to Aguiní's and Solarino's (2019) emphasis on transparency in qualitative research, the criteria and process for selecting respondents for this study will be presented. This is primarily done to enhance the replicability and trustworthiness of the study's findings. The sample of respondents consisted of consultants and managers within IP and IP strategy. We primarily contacted respondents who work with IP at companies that have an established research and development department and an IP department. These companies were

considered large based on the number of patents they apply for, the amount of capital they invest in R&D, and the number of employees they have in the R&D departments.

To identify these relevant companies, we referred to IVA's *FoU-barometer 2023* (2023) and the Swedish Research Council's report *Företagen som finansiärer och utförare i det svenska forskningssystemet* (2022). From these reports, we used the lists of companies with the greatest investments, in terms of both monetary and people investments, in R&D to identify where companies are likely to have designated roles for IP management and IP strategy. In addition, a similar review was conducted using the Swedish Intellectual Property Office website's news with the title *Starkt år för svenska patentansökningar* (2024). The page provides rankings of companies with the highest numbers of patents for the year 2023 and was used to gather information regarding which industries companies potentially have large patents portfolios and then possibly fit the scope of this study.

Based on the research using IVA's, the Swedish Research Council's and PRV's reports and websites as guidance, suitable companies and respondents were identified. 50 invitations were sent out and 20 were able to participate in an interview. Since the sample consisted of people with different roles and connections to IP, two interview guides were constructed; one for IP consultants and one for IP managers (see Appendix).

2.4 Data Analysis

Coding is a method of analysis where the data is divided into different components which are assigned a code based on the thematic contents of the component (Bell et al., 2022). Through coding different themes can be found in the data, interviews in the case of this study, with the aim of organizing and simplifying the data for analysis. By doing these parallels can be drawn between interviews, enabling the analysis, and drawing of broader conclusions.

In this study the coding was done at two levels, where the first one contained specific themes and statements, and the second one grouped code from the first level into more general main categories. All interviews conducted were recorded and transcribed, and then coded individually by one member of the research team, where first order codes were identified as well as potential second level codes. Nonetheless, all first order code was read and discussed by all authors of the report in order to create the second order code together, thus reflecting the result as objectively as possible. Despite the limitations, the thorough discussions and analysis of the first and second order codes ensured robustness and credibility of the findings. After completion of all interviews all members of the research team worked together to compile the coded interviews and to group the first level codes into appropriate, more generalized, second level codes. These were then in turn grouped into the three aggregated dimensions, which constitute the subsections of the result.

A potential drawback of this kind of analysis is that the researchers' personal opinions or views on the subject matter might affect how the data is analyzed and presented, increasing the risk of subjectivity (Bell et al., 2022). Since the study is broad and less structured than a quantitative one, the coding and analysis of the result is done in a way that might then be impacted by the personal bias of the researcher conducting this work. To minimize this effect, and achieve a more consistent treatment of the data, there was an open dialogue and collaboration between all members of the study in the coding of the result, as to minimize the effects of the individual researcher's bias.

3. Theoretical Framework

The following section presents the theoretical framework regarding the technological shift of AI and the field of innovation, IP and IP strategy. The fundamentals of both AI and IP will be described as well as the intersection of the two fields.

3.1 Technological Shift of Artificial Intelligence (AI)

The following section firstly presents a description of what AI is, then describes the history of AI, some terms regarding AI and lastly presents where the technological shift of AI is today.

3.1.1 Development of AI

Tableau (n.d.) describes AI as a field of systems in computer science that are trained on a myriad of data to replicate human intelligence and problem-solving abilities for future usage. The first groundwork for AI was done in the early 1900s. The idea of creating artificial humans or a robot was a concept that was developed by scientists during the first half of the 20th century. Simple robots supposed to be human-like were developed in the 1920s using steam power. In 1949, when computer science was further developed, the book “Giant Brains, or Machines that Think”, comparing computer models to human actions, written by the computer scientist Edmund Callis Berkley was published (Tableau, n.d.).

What today is known as AI was in its first stage implemented in the 1950s. Alan Turing published the paper “Computing Machinery and Intelligence” in 1950. The work stated the question “Can machines think?” which began the comparison between man-made works and works made by machines (Stryker & Kavlakoglu, 2024). In 1952 the first learning computer model was created, the model could play checkers which was the first model to be able to play and learn the game independently. Moreover, the word artificial intelligence was used for the first time in public by John McCarthy in 1955 making the word and concept more publicly known (Tableau, n.d.).

During the time between the 1950s until 1980s was a time of further creation and development of computer science and AI models. From the 1950s to the beginning of 1970s the programming languages which are used today were developed and further research on AI algorithms was done. During this period the first human-like robot was developed as well as the first autonomous vehicle (Tableau, n.d.).

In the years from 1980 to 1987 the area of AI and computer science boomed (Tableau, n.d.). The algorithms and models of machine learning were developed (Stryker & Kavlakoglu, 2024). Machine learning is a part of AI which consists of algorithms and models that can learn how to use data in statistical methods and perform data analysis. The algorithm processes data to later be able to use similar data to do the intended task (Tableau, n.d.). There were several breakthroughs through research and the first deep learning models were created. The deep learning models could be trained using data and when giving the wrong output they could both learn from their own mistakes and independently make decisions (Tableau, n.d.).

In the period from 1987 to 1993 the interest in AI as an independent area of science declined and after getting substantial amounts of funding it was now difficult to get funding, which led to fewer research possibilities and breakthroughs. Later in the 1990s, the area got more funding and the first model that could beat a world champion in chess was introduced and got a lot of publicity. Further in the early 2000s the AI models became more widely adopted in several areas. For example, in 2003 Nasa navigated the surface of mars without any human assisting the system and in 2006 Facebook, Netflix and Twitter began using AI algorithms in their product for the purpose of enhancing the user experience (Tableau, n.d.).

During the 2010s the deep learning models mimicking human brain functions were further developed (Stryker & Kavlakoglu, 2024). The use of the models was used both in Apple's assistant Siri and other language processing assistants which beat humans at listening and comprehension tests. Moreover, in the beginning of the 2020s deep learning models called generative, or gen AI, using several layers of nodes to create original and new content, were created for commercial use (Tableau, n.d.).

3.1.2 Machine Learning

Machine learning is a part of AI which consists of algorithms and models that can learn how to use data in statistical methods and perform data analysis. The algorithms process data to later be able to use the knowledge about the previous data when analyzing similar data to do the specific task (Tableau, n.d.). Tableau writes that AI algorithms of this type do not generate new work being thinking and creative. Some frequently used machine learning models are large language models which are trained on large amounts of data to recognize the structure of the specific language and generate a natural language when getting a prompt (IBM, 2023).

3.1.3 Deep Learning

Stryker and Kavlakoglu (2024) describes deep learning as “a subset of machine learning that uses multilayered neural networks, called deep neural networks, that more closely simulate the complex decision-making power of the human brain.” The networks are layers of connecting nodes that can extract hidden relationships and insights about large amounts of unlabeled data (Stryker & Kavlakoglu, 2024).

3.1.4 Generative AI

Generative AI is deep learning models that when getting a prompt or question can create original content that is realistic, for example models can create images, videos and text that seem to be realistic or human made. In developing generative AI models there are three stages: training, tuning and evaluation. When developing algorithms firstly the deep learning model is trained with training data to create a neural network of nodes which is used as the basis of the model. When tuning the model is applied in a specific task. After tuning the model is prompted for the specific task using labeled data and the output is then evaluated. (Stryker & Kavlakoglu, 2024). Some examples of models using the algorithms of generative AI are large language models such as Open AI's ChatGPT and Microsoft's Copilot (Martineau, 2023; Microsoft, 2024).

3.1.5 Current AI Implementation

As of 2025 businesses are in the implementation phase of the technological shift of AI where the future potentially holds a lot of operational change (Shapero, 2025). According to Singla et al. (2025), as of now, organizations are in the beginning of reorganizing workflows to capture value from generative AI tools. Businesses are also in the midst of making organizational changes but primarily the changes that have been made now are related to workflows and day-to-day tasks rather than changing whole organization schemes and hiring has not changed in a disruptive way yet (Singla et al., 2025).

The most frequently used form of AI in businesses, is AI as a tool. These are primarily using machine learning and large language models to “boost employee productivity, and drive business value” (Quiroz-Vázquez & Goodwin, 2024). Moreover, the AI tools are mostly used to process text, images, computer code, videos and more (Singla et al., 2025). AI is also used when optimizing, making decisions, doing data analysis, in sales, in marketing, doing research and more (Quiroz-Vázquez & Goodwin, 2024). Furthermore, AI is also a part of many commercial applications used in business processes and can potentially through embedding in the product development of software fuel innovation (Gnanasambandam et al., 2025).

As well as being an application, AI can be embedded in value offerings. Bughin et al. (2017) stated in a McKinsey & Company report that 20% of businesses had AI in their value offering. Further, according to PwC’s (n.d.) survey *2025 AI Business Predictions* conducted in 2024, a third of technology leading companies have fully implemented AI in their internal processes and value offerings, which describes the implementation of AI today.

3.2 The Innovation Process

Utterback (1971) introduces the innovation process in his article *The Process of Technological Innovation within the Firm*, defining it as consisting of three phases: idea generation, problem solving and implementation. Research and Development (R&D) involves the activities that are done when innovating, for example market research, product development and testing (Kenton, 2025). The activities that are done within R&D therefore align most closely with the first two phases of the innovation process, namely idea generation and problem solving. Since the result of innovation processes often lead to IP in the form of inventions, aligning the management of a company’s innovation process with their IP strategy is essential to ensure protection, value capture, and strategic fit with the overall business model (Granstrand, 1999).

The following sections will present two strategies to managing the first phase of the innovation process: closed innovation and open innovation. Where closed innovation emphasizes keeping idea generation within the company, open innovation sees value in incorporating external ideas alongside internal ones. Finally, the role of AI within the innovation process will be presented.

3.2.1 Closed Innovation

The traditional approach to innovation is closed innovation, which implies that all R&D activities are done in-house, i.e. the first two phases of the innovation process described by

Utterback (1971). Resources in the form of knowledge or information are created and stay within the company. Closed innovation highlights the protection of IP and the generation of ideas within the company's boundaries, to make sure none of this exclusive technology or “know-how” are leaked to, for instance, competitors (Kita & Ohtsuka, 2011). Some companies also decide to keep R&D in house to make sure the resources spent on innovation align with their business model and strategic goals (Culpan, 2014).

3.2.2 Open Innovation

In contrast to closed innovation, a more contemporary approach is open innovation (OI). OI started to gain attention when Henry Chesbrough released his first book on the subject in 2003. Further, Chesbrough et al. (2006, p. 1) define OI as an idea in which “firms can and should use external ideas as well as internal ideas [...] as they look to advance their technology”. Discussion about OI strategies have in recent years become increasingly popular. This could partly be explained by the technological shift of digitalization, which has allowed companies to more efficiently search, process, and share information, making them more inclined to search for external sources of knowledge (Nieto et al., 2023).

3.2.3 AI’s Role within the Innovation Process

Given that digitalization has heightened the interest of OI, it is worth examining whether AI will have a similar or distinct effect on it. According to Holgersson et al. (2024), AI affects OI in several ways. More specifically, AI can enhance the practices of OI used today, replace them, or establish new ones. For example, AI can potentially replace or reshape OI due to its capability of automating idea generation. Previously, companies had trouble generating ideas and often used external sources of knowledge in their idea generation. However, with AI’s capability to automate idea generation, it might not be necessary to look externally. At the same time, the rise of AI enabled open-source intelligence (OSI), referring to the practice of collecting, analyzing and distributing information from publicly available sources. Specifically, AI enabled a new business model which uses openly available knowledge and turns it into proprietary intelligence (Holgersson et al., 2024). Thus, OSI collects data from external sources only, while OI involves using both internal and external ideas.

Furthermore, it is also worth examining whether AI has or will have an effect on the innovation process itself. This is something Brem et al. (2023) explore in *The AI Digital Revolution in Innovation: A Conceptual Framework of Artificial Intelligence Technologies for the Management of Innovation*. They first highlight AI as an input factor in the innovation process, providing several examples of the types of input AI can give. For instance, they showcase that AI can streamline the process of analyzing and retrieving documents, such as patent data or scientific publications, to identify specific research areas and determine whether these areas are growing or declining. Furthermore, they write that AI is an enabler of the innovation process. More specifically, that it can revolutionize both general creativity but also idea management systems.

3.3. Intellectual Property (IP)

Intellectual properties are “of intellectual or intangible character” according to Granstrand and Holgersson (2015). To further explain IP strategy in the context of this study the following section addresses the areas of intellectual property rights (IPRs) and IP strategy.

3.3.1 Intellectual Property Rights (IPR)

An intellectual property right (IPR) is the legal protection of intangible assets, granting the owner temporary transferable rights to it and the ability to exclude others from using it (Grandstrand & Holgersson, 2015). This protection can come in the form of patent protection, trademark, copyright, know-how, design protection or trade secrets for example. Grandstrand and Holgersson further explain that the intended function of some IPRs is to incentivize R&D investments in IPs and to make innovations public, the latter being described as “utilitarian grounds” for justification of the IPR system.

3.3.2 IP Strategy

To optimize a company’s assets and create competitiveness, the company needs a strategy. An IP strategy can be described as a method that companies utilize in order to manage the value of their intellectual properties (PRV, 2024). WIPO (2025) defines an IP strategy as “a company’s plan of action to manage and protect its intangible assets”. Further, PRV (2024) describes that the purpose of an IP strategy is to optimize the assets to achieve commercial value.

To create an IP strategy there are several steps to be completed. WIPO (2025) has a checklist over the general steps for commercialization of a company’s value offering regarding IP. The checklist is divided into four parts: ideation process, product and service development, IP protection and IP commercialization. The first stage, the ideation process, is about identifying IP assets and capturing these assets, as well as identifying potential partnerships and competitors. The second stage, product and service development, covers how the company searches for potential competing IPRs, Freedom-To-Operate (FTO) searches and whether the company is collaborating with a third party regarding IPRs. The third stage, IP protection, is about identifying the right strategy to protect the assets and prioritize the IPRs, as well as monitoring ownership and aligning the IP strategy with the commercialization strategy. The final stage, IP commercialization, is about identifying processes to evaluate IP assets, monitoring activities among competitors and reviewing the assets.

The four parts of WIPO’s (2025) checklist are furthermore similar and can be connected to the phases of the innovation process described by Utterback (1971). Utterback describes the first phase as idea generation, which is also the first stage within WIPO’s commercialization checklist. Utterback further describes the problem solving as the second phase which can be connected to WIPO’s (2025) product and service development stage, the second step of commercialization. Lastly, Utterback’s phase of implementation is connected to the last part of innovation, including the last stages of WIPO’s checklist regarding protection and commercialization. In addition, this somewhat aligns with the five dimensions of an IP strategy discussed by Al-Aali and Teece (2013).

Al-Aali and Teece (2013) describe five dimensions, within an IP intensive economy, as a result of a transformed global economy. The first dimension covers how, when and which IPR that should be applied, the second covers the relevance of outsourcing or OI strategies due to the rapid growth of various sources of inventions. The third dimension covers what business model is best suited due to development of markets for IP. The fourth dimension discusses how strategies are not only limited to IP but also correlated to the presence (or absence) of complementary assets. The fifth dimension is about R&D decisions where assessing suitable business models to enable profitability is a key aspect (Al-Aali & Teece, 2013).

Al-Aali and Teece (2013) five dimensions are as WIPO's stages connected to the innovation process described by Utterback (1971), adding to the framework for innovation process. Utterback's first phase, idea generation, is connected to Al-Aali and Teece's first, second and fifth dimensions. They include IPR strategy, open innovation and R&D strategy. Moreover, Utterback's phase of problem solving is connected to Al-Aali and Teece's second, third and fifth dimensions, which includes open innovation, business model and R&D strategy. In addition, Utterback's last phase, implementation, is connected to Al-Aali and Teece's first, fourth and fifth dimensions. These include IP protection, alignment with business models and control of complementary assets.

The similarities between Utterback's (1971) innovation process, WIPO's (2025) checklist for commercialization and Al-Aali's and Teece's (2013) dimensions of IP highlights the connections between the innovation process and the IP strategy. This demonstrates that the innovation process contributes not only to the creation of IP but also the IP strategy.

In addition, when developing an IP strategy it is important to analyze the company's goals, competitors and legal guidelines that the company must follow. Optimizing an asset requires an understanding of how every IP affects the company and implementing the most optimal strategy to achieve this, since different IPRs have different purposes (PRV, 2024).

Moreover, an IP strategy can cover various approaches regarding the protection of IP. For example, if there is an intrusion on a copyright protected innovation, it affects the company on an operational level. An IP strategy can also cover questions such as whether a company should apply for a certain patent they need or license out a patent the company does not need. This can be connected to the company's overall business goals on a strategic level (PRV, 2024). Grimaldi et al. (2021) write that "an IP strategy should reflect the overall business strategy and allow creating, acquiring, and governing IP, as well as extracting its value". The connection between them and the company's overall business strategy is moreover defined by Boyles (2022), who refers to the strategic decisions and goals that guide an organization in creating value for its stakeholders while staying competitive.

Staying competitive is central for businesses and the strategic view is conceptualized within the Resource-Based View theory by Barney (1991). Barney's theory provides a foundation for understanding that a company's internally developed assets possess a strategic value when requiring a competitive advantage. The concept is based on the fact that the assets should be; valuable, rare, imperfectly imitable and non-substitutable for it to strategically contribute to a company's competitiveness. Both IPs and IPRs align closely to these requirements: they are valuable within the business model, the invention behind the IP is intended to be kept rare, difficult to imitate and when successfully protected there should be no or low substitutability. In this context, the dynamic aspect of IP strategy becomes crucial

as changes in the technological landscape appear. Barney's theory can therefore be considered relevant and useful when exploring how IP is used and works for companies striving to maintain competitiveness.

Another theory that is central to what strategy is and how it works is Porter's Five Forces Model. Porter (1979) first outlines that strategy for a company is based on both understanding and handling competition. Further, Porter identifies five forces that impact on the competition a company or industry possesses: the existing competitors, the threat of new entrants, bargaining power of customers, the threat of substitutes, and the bargaining power of suppliers. Together these shape the competitiveness of an industry and determine the profitability which is the foundation for a strategy. For IP strategy the industry's environment influences how IP is managed and prioritized in companies. If the forces aimed at a company shift, based on new technological shifts, companies may need to adapt their IP strategies accordingly to maintain or strengthen their market position (Porter, 1979).

In addition to Porter's model, the dynamic capabilities framework by Teece et al. (1997) further emphasizes the need for firms to be able to sense, seize, and reconfigure resources in response to changing environments. Their perspective is particularly relevant in context of rapid technological shifts. When the IP landscape evolves as a result of a technological change, companies must adapt their IP strategies to ensure continued competitiveness which requires dynamic capabilities. The work of Teece et al. (1997) further supports the need to view IP strategy as a dynamic and evolving plan rather than static.

In summary, IP strategy is a dynamic strategic plan concerning a company's IPs governed by the company's goals and overall business strategy. WIPO's (2025) checklist regarding how commercialization works aligns with the innovation process phases previously described by Utterback (1971) and Al-Aali and Teece's (2013) dimensions. In addition, Barney (1991), Porter (1979) and Teece et al. (1997) add on to the concept of strategy in connection to IP and IP strategy. The models and concepts all address that strategic aspects are dynamic since the environment is in constant change.

3.4 Integration of AI and IP

This section describes how AI can be implemented within IP and what challenges and opportunities that may arise when utilizing AI in the field of IP, as well as the protection of AI inventions.

3.4.1 AI as a Tool in the Patent Process

One of the topics discussed in today's society about AI and IP is whether AI can be implemented in the patent process. According to PRV the patent process includes all the steps from the creation of an invention to getting it patented (PRV, 2023). The steps include idea generation, prior art search, writing and submitting a patent application, getting the patent granted and managing the patent.

One of the conditions for patentability is the novelty of the invention. WIPO describes novelty as something new based on prior art, meaning that the invention must have new characteristics which are not previously known to the filing date (WIPO, 2025). According to Lizarralde and Contreras (2022), AI tools can assist patent applicants in assessing the

patentability of inventions, especially in the prior art search. This process is necessary to avoid a potential rejection of the patent, as well as infringement on other patents. Since the amount of information available worldwide has increased immensely, the prior art search has become a challenge for the majority of patent offices and applicants. Utilizing AI can support the process by scanning documents and literature for specific keywords and synonyms, which save time and effort for the patent applicant. Nevertheless, Lizarralde and Contreras highlight the importance of AI as a supporting tool for the process; it cannot replace a human patent searcher since interpreting patents requires specialization in detecting similarities between different patents and understanding the literature, which AI lacks.

Furthermore, WIPO (2024) highlights the issues regarding work produced by generative AIs in the article *Generative AI: Navigating Intellectual Property*. The article describes that generated work may contain illegal outputs, incorrect information, IP infringement as well as personal information. Moreover, WIPO explains that the majority of the IP laws in different countries were written before the AI boom, which leads to uncertainties regarding the ownership of rights of AI-generated work. Another problem described by WIPO is that generative AI may save and train on the user's prompts, which might lead to leaks of confidential information, including leakage of trade secrets. Therefore, it is important to check the settings on the AI tool in order to minimize the risks of the provider saving prompts and information. To avoid IP infringements, the user should consider using AI tools that only rely on licensed, public domain or the user's own training data. These concerns make it challenging for companies to navigate the AI and IP landscape, as well as implementing generative AI in the patent process.

3.4.2 IP Protection of AI Related Inventions

When integrating AI into a value offering, the integrated solution constitutes software. Hemphill (2004) describes that trade secrets as a form of IP has become increasingly used in the information technology industry. He describes several reasons for using trade secrets, such as lower protection costs compared to patenting and hence choosing trade secret protection when patenting is not economically reasonable. He further discusses that trade secrets could be utilized when the IP is not believed to fulfill the requirements for patent protection. Furthermore, patenting also necessitates disclosure of information, which decreases the attractiveness of patenting if pursuing patent infringements becomes more difficult.

Further regarding disclosure, Aboy et al. (2024) discuss the necessity to disclose training data when patenting AI inventions as part of the patent description. They highlight how AI systems can be seen as too generic for patent protection before being trained to solve specific tasks, and that "...the mere idea of applying an AI system, a neural network, ML or deep learning to solve a technical problem may not meet inventive step requirements". They also explain how disclosing details on the training and/or system architecture might in some cases be necessary to receive patent protection.

3.4.3 Protecting AI-Generated Inventions

The technological shift of AI has created new opportunities regarding innovation. Simultaneously, it also gives rise to legal challenges regarding the liability and ownership of

AI systems, the patentability of AI-generated innovations and questions of authorship and rights over AI-generated solutions involving multiple system components.

Under current legislation in most jurisdictions, only a human can be recognized as an inventor, which excludes AI from being named as inventors on patent applications. There are, however, ongoing debates about whether AI should be granted legal authorship and ownership status over its creations, with arguments for encouraging AI innovation and compensating human contributors. For instance, if the inventor of an AI system or the AI system itself holds the right to an invention created with minimal to no direct human effort (Bisoyi, 2022).

Whether AI should be given, for instance, copyright protection is currently debated and some argue that AI-generated works should be protected to encourage innovation, while others claim that human input is still necessary for eligibility. As the capabilities of AI develop, legal frameworks need to adapt to handle these challenges. Some even suggest that a differentiated patent system for AI-generated solutions and inventions might be necessary (De Rassenfosse et al., 2023).

3.4.4 Patent trolling

Patent trolling, presented by Zimmer (2021), is when companies, often called "non-practicing entities" (NPEs), buy patents not to create products or services, but mainly to enforce patent rights against others who do. These entities aim to make money by demanding licensing fees or by suing companies they claim are infringing on their patents. Unlike traditional innovators, patent trolls do not help drive technological progress or economic growth, instead they use the patent system mainly to seek profits without contributing to real innovation.

The growing problem of patent trolls is described as being a real threat to innovation, especially in the technology and software sectors (Zimmer, 2021). Companies often have to shift valuable resources away from research and development to defend themselves against lawsuits or to pay settlements, slowing down technological progress. This threat seems to have grown especially in recent times, as Ramalho (2018) presents that AI enhances patent troll's abilities to reduce time needed in the innovation process, particularly within idea generation. Potentially patent trolls can file high volumes of patents quickly. As a consequence, potential legal uncertainties arise and threats for current companies with a high focus on patenting inventions (Ramalho, 2018).

4. Results

In the theoretical framework an IP strategy is described as identifying and capturing IP assets, determining the most effective and strategically aligned way to do so, as well as mapping competitive activities and already existing IPRs to support product and service development. Through coding the interviews conducted in this study this definition was confirmed, and three main aspects of working with IP strategies related to this definition were identified. These aspects are *operational*, *legal* and *strategic* and represent the aggregated dimensions and aim to structure the result.

The operational aspect of the IP strategy is defined as matters regarding the day-to-day activities of the IP department. This mainly includes the tools used by the department and the IP department's relationship with R&D and innovation processes. The tools include IP management software, search tools used to determine existing IPRs, infringements and FTO as well as generative AI tools used to automate various tasks. The relationship to R&D concerns how the IP department works with R&D to, for example, determine how an innovation is protected, which areas of innovation to focus R&D efforts on as well as informing R&D on competitors' IP activity.

The legal aspects of working with IP strategies concern areas such as data protection, legal agreements, regulations and concerns due to legal grey areas regarding AI-generated content. The scope of this aspect then includes both internal concerns as well as the larger legal and regulatory systems in which the company operates.

The last main aspect to be identified is the strategic one. It relates to matters regarding long-term planning of IP and IPs' relationship to the company's business strategy. This encapsulates areas such as resource allocation, cross-company collaboration as well as choices of IP protection.

Due to the nature of this qualitative study, some codes can fit in more than one category but have been assigned one based on the most logical division of the result. The three identified aspects are discussed below, with their respective second order codes acting as subheadings. The structure of the coding is also presented below (see Figure 1). Since the interviews touch on the current situation as well as expectations regarding the future, the statements in the coding are a mixture of these. Statements regarding future expectations are hence separated and marked with dash-lined boxes for clarity.

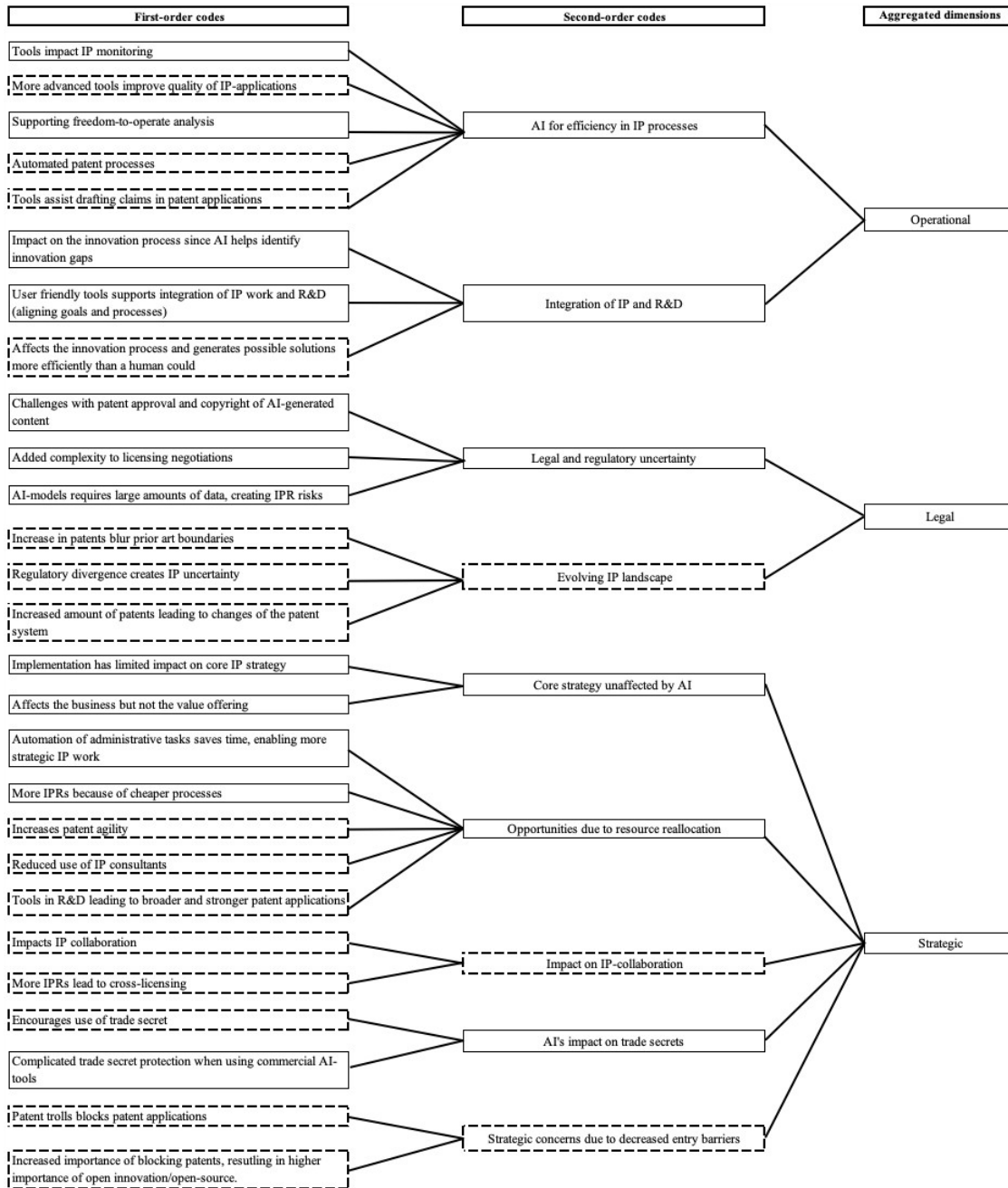


Figure 1: Data structure.

4.1 Operational

4.1.1 AI for Efficiency in IP Processes

A recurring topic among the respondents' answers regarding AI influencing the companies' IP strategy is how AI, as a tool, can increase the efficiency in IP processes. This includes patent applications, determining FTO, searching among existing patents and monitoring IP infringements. Some respondents are already using AI as a tool to support the patent process, while others could see the potential of implementing AI in the patent process in the near future.

AI tools are used by some for creating claims in patent applications, and many are interested in the potential even if they are currently not using it. Other respondents explained that they are using AI for searching among existing patents. Some respondents explained that they think there is a high probability of some stages in the patent process becoming automated in the future. This includes the stages of drafting a patent, applying for a patent and comparing between different patents.

There is immense potential. I believe in the whole chain really. It is about handling an enormous amount of information and that is what AI is kind of good at [...] Tools for the entire process from searching for patents and comparing them to patents or other people's patents, to drafting patents and to formulating answers and goals. And I think we will see the patent office use AI to a much, much greater extent in the future.

Furthermore, some respondents explained the application of AI to determine FTO. They described that there are powerful tools that are both effective and create a solid foundation to work much more iteratively in the process. Moreover, some respondents described that they utilize AI tools to monitor IP infringements across different digital platforms and to monitor activity among competitors. This is used in order to identify copycats, oversee activity regarding what type of patents that are being submitted among competitors, and where the technological development is heading.

Also, Freedom-To-Operate analysis and similar stuff have quite powerful solutions [...] With the AI tools we use now, you have a completely different opportunity. It is like having an intelligent person that you sit and discuss with. So, when the inventors say something new, you can kind of twist it like this and turn it like this, you get a new result right away. In that way you get a much more iterative process to work.

However, several respondents highlighted the complications of using AI in the patent process. They explained that there is a risk with bias and/or mistakes regarding information that AI tools can make when writing patent applications. Hence, the author of the patent must be critical and verify the information written by the AI tool, some respondents explain.

If I'm given a text, I have to be very critical when reading it. Usually, they are incredibly well written, great English, and it is almost like you become a little blind.

It does not always turn out right and then you feel that you want a very high level of quality within patents [...] It is a legal document.

4.1.2 Integration of IP and R&D

When asking the respondents if AI has affected or is expected to affect their innovation process, some respondents believed it will. A common theme was the expectation of AI to create a closer integration of IP and R&D departments. Particularly, some consider that AI will be able to identify areas within a company that require innovation. Several respondents also mentioned that their R&D departments are starting to use AI to streamline their patent creation process, hence integrating IP and R&D. This aligns with another recurring topic among the respondents, that the development of user-friendly AI-tools will enable closer collaboration between IP and R&D. As a result, this could better align the goals and processes of IP and R&D.

Respondents also stated that AI is beginning to change the way of working, with the potential of reshaping the innovation process itself. While several respondents believe AI will speed up the R&D-process, one respondent stated that AI already has sped up the R&D-process. Specifically, due to AI enabling better data modelling and enabling them to interrogate their own data.

The way you can model data and the way you can sort of interrogate your own data has become so much more interesting and so much richer with the advent of AI.

Another topic that arose was the integration between OSI, a branch within OI, and R&D. One respondent mentioned that it is important for researchers to compare their results from experiments with what others have done. A vital factor in enabling such a comparison is the use of a common data set across studies. Consequently, it is a big advantage for companies to become the preferred data set, as it brings high exposure and gives actionable results. The respondent further emphasized the value of using open source – making their data openly available – in order to increase its use within R&D, thus enhancing the likelihood of becoming the preferred data set.

We have a big data set that we keep openly available to others [...] The more who work with our data, the more we can get back from it. This is especially true in the research world [...] All researchers want to use the same data set, otherwise, it is like comparing apples with pears [...] So, of course, there is a branding aspect to it, but more importantly, it let's us build on the results that others have come up with. Suddenly, we kind of get a free researcher community that we can tap into in a whole new way.

4.2 Legal

4.2.1 Legal and Regulatory Uncertainty

Many respondents highlighted significant challenges in determining both the legal authorship and the ownership of AI-generated work, particularly regarding protection through copyright and patent. Legal experts are actively debating these issues, especially the definition and outline between what is made by a human and what is AI-generated content and its consequences for revenue distribution. Currently, it is difficult to obtain patents related to AI. To patent a process, it must deliver the same result every time, so it is tricky to patent such AI-generated support.

You just have to be careful how you phrase it and which aspects of it you're trying to protect.

Furthermore, respondents expressed concerns regarding data usage. The necessity for large datasets to train AI tools raises potential legal issues connected to IPRs.

Data protection is part of our IP strategy, especially in relation to what we share with external tools.

Additionally, respondents answered that collaborations including software solutions involving AI today often turn out to now include more complex contract negotiations.

4.2.2 Evolving IP Landscape

Today IP laws are relatively harmonized globally, however this can be changed due to the development of AI. This shift is characterized by for instance the development of new regulatory frameworks which are set at different rates in different countries, creating legal uncertainty. There are regulations emerging within IP protection and also change within what is patented. Many respondents believe that there will be an increase in patent applications, which may lead to an expansion of the body of prior art, further complicating the determination of patentability. Additionally, some state that lobbying and dialogues with governments could play a larger role in IP work.

Respondents raised concerns that an increase in both patent applications and the use of AI tools to assist IP work could lead to difficulties in maintaining the current patent system. If AI can both create new inventions and contribute to a rapid expansion of prior art, this could ultimately lead to a collapse of the legal system.

One can imagine that it could become so easy to produce a technical solution that it would be pointless to even apply for a patent.

A parallel was drawn here to design rights within the fashion industry, which are intended to grant ownership over specific patterns. When the fashion industry shifted from releasing collections seasonally to launching new collections more frequently with the rise of fast fashion, design rights lost much of their value.

It is meaningless with that type of protection, because design development moves so quickly. There's no point in letting people work with administration to get rights they cannot make use of [...] And one can imagine something similar with the patent system, where it suddenly becomes so easy to create new technical disclosures.

4.3 Strategic

4.3.1 The Core IP Strategy is Unaffected by AI

When asked whether their core IP strategy has been changed by the implementation of AI, most respondents did not consider there to have been any significant changes. The majority explained that their IP strategies, which are planned in relation to the larger business's

strategy, have long-term time perspectives and are hence not changed quickly by shifts in technology. One respondent also described their IP strategy as “technology neutral”, and hence unaffected. Many also explained that their implementation of AI has not changed their value offering since AI is mainly used as an operative tool or a small addition to their already existing technology.

4.3.2 Impact on IP Collaboration

Regarding changes to cross-company collaborations because of AI implementation, the results varied across the respondents. Some believe that AI implementation could lead to more collaboration, especially when companies seek to expand their value offerings with AI technologies that they lack the internal expertise to develop themselves. In contrast, some actors in less competitive markets believed that it would lead to less collaboration because of increasing complexity. One respondent said that cybersecurity concerns definitely make collaborations and agreements with other companies more complex.

Due to expectations that AI tools could lead to more IPRs being generated, some respondents also believe that they may participate in more patent-pooling and cross-licensing agreements as AI technology develops. An increasing number of IPRs and hence more potential risk of infringement could lead to less FTO, necessitating collaboration. In contrast, some respondents believed that AI does not impact opportunities for collaboration at all.

I don't see any major change. Collaborating with other companies for innovation or pursuing internal development has always been two existing options, and that remains the same even with AI.

4.3.3 AI's Impact on Trade Secrets

When AI is integrated in products it might affect how such products as IPs are protected. Some respondents discussed that protecting these innovations might differ from the traditional approach of patenting since the technology is of a different nature. When the technology is hidden and not visible to the end consumer, they might be more inclined to protect the IP using trade secrets rather than patents. It was also explained that such innovations might be protected through trade secrets since infringements on these types of IP are harder to detect. This view was however not the case for all respondents, with some being comfortable in protecting their AI innovations through patenting.

Regarding trade secrets some respondents also expressed concerns regarding safeguarding them when utilizing AI tools such as ChatGPT in their operational work, since it is not always clear how the models save the inputted data. This has led to restrictive policies regarding how employees are allowed to use AI tools in their work. Many respondents also discussed an increasing awareness of the importance of cybersecurity as data and other trade secrets are gaining importance in their businesses.

4.3.4 Opportunities due to Resource Reallocation

Most respondents stated that the resources freed up through AI-based automation of administrative tasks in the field of IP are expected to enable increased focus on strategic work

and long-term planning within IP departments. This reallocation of efforts is considered to contribute to a more proactive and business-driven management of intellectual assets.

Furthermore, the results indicate that a significant portion of respondents believe that the efficiency improvements and cost savings resulting from the implementation of AI tools will lead to an increase in the number of IPRs generated, particularly in the form of patents. One underlying reason for this is the belief that innovations that previously were deemed to be economically unfeasible to protect may now become viable for patenting, as the costs associated with the patenting process decrease. The increased ability to initiate more patent applications may offer companies enhanced flexibility to align their IP strategies with evolving conditions and bring them closer to the overall business strategy, thereby enabling more agile and dynamic management of innovation portfolios.

There is also a perception among some respondents that improved AI-tools could reduce the need to hire external IP consultants, as such tasks could be handled in-house with the support of AI tools. Consequently, some respondents believe that internal IP work will be strengthened as a result of these technological advancements.

In addition to a projected increase in the number of patent applications, some respondents also believe that AI-tools used within R&D may streamline the creation of variations of an innovation, potentially resulting in broader and stronger patent applications. One specific example mentioned to illustrate this speculation concerned chemical inventions, where AI tools could generate different ways of arranging the molecules in a chemical compound.

[...] leave long lists of chemical compounds that one then considers or as one then claims are and then one can patent them together because of their similarities [...] And that it therefore with help of the AI technology one could create larger and broader patent applications.

4.3.5 Strategic Concerns due to Decreased Entry Barriers

According to several respondents, the lowered entry barriers enabled by AI-driven patent generation present strategic challenges. A repeated concern raised in this context was the potential for so-called patent trolls to exploit AI tools in order to rapidly and cost-effectively generate large volumes of patents, with the aim of targeting specific companies. These actors strategically position themselves to use IPRs to block or hinder other companies' patent applications, and not for promoting innovation.

AI could for sure lead to an explosion of patent applications, and these could potentially be targeted even more strongly at specific companies that the patent troll seeks to target.

In light of this, several respondents emphasized the importance of adopting more strategic approaches to creating blocking IPRs as a defense against actors with exploitative intentions. Some respondents also highlighted the growing significance of open innovation and open-source models in this regard. These approaches were seen not only as ways to encourage collaboration and innovation, but also as tools to counteract the negative effects of aggressive IP strategies.

5. Discussion

The discussion connects the results, in which three main categories were identified: operational, legal and strategic, to the previously presented theoretical framework to address the research questions. Further, future potential research in the field of IP and AI will be discussed.

5.1 Operative Use of AI Tools in IP Departments

The observed changes mainly relate to the various AI-integrated tools that are currently being used operationally by many IP departments. The findings show that many are using AI tools to assist management of IP. This in turn indicates that AI could be seen as a tool for enhancing the efficiency of certain aspects of an IP strategy. As previously mentioned, the four stages of an IP strategy described by WIPO (2025) are the ideation process, product and service development, IP protection and IP commercialization.

The results show that some are using AI tools to monitor IP infringements across different digital platforms and to monitor activity among competitors, which is connected to the fourth stage of an IP strategy according to WIPO (2025). By utilizing AI in this part of the IP strategy, a company can increase the efficiency when searching for IP infringements and monitoring competitors, compared to companies that do this manually. In addition, AI might enable a wider and more exact search when detecting infringements as well as activities among competitors.

Moreover, the findings show that many are already using AI as a tool to increase the efficiency in the early stage of the patent process, while others could see opportunities with implementing AI. Some respondents are using AI to support the prior art search and in the FTO analysis to search among existing patents, which can be connected to the first and second stage of an IP strategy according to WIPO (2025). This aligns with the possibilities of utilizing AI in the patent process discussed by Lizarralde and Contreras (2022). They explain that due to the large amount of information available worldwide, the prior art search has become a challenge for many patent applicants. By using AI to scan documents and literature for keywords and synonyms, this part of the patent process can become more efficient. The prior art search is a vital stage of the patent process since the novelty of an invention is based on this (WIPO, 2025). AI can therefore be, and is, a useful tool to help assess the patentability of an invention.

Although most respondents consider AI tools helpful and promising within IP departments, some are still skeptical. In fact, a majority of the respondents highlighted the complications of generative AI. In the patent process, the respondents who were using AI to write patent applications described challenges of bias and misinformation. Even though the draft of the patent application might seem professional and well written, there might be a risk of finding bias or wrong information stated in the application. This leads to uncertainties regarding how trustworthy AI-generated work is and the patentability of the invention, which aligns with the risks of using generative AI explained by WIPO (2024). Some of the risks include illegal output, incorrect information, IP infringement as well as personal information in the AI-produced work. Hence, it is understandable that many respondents are hesitant to use AI-generated work in fear of rejection of a patent claim or infringing on other patents. The

concerns regarding generative AI seem to hinder the technology as of now, but there is immense potential as the technology keeps advancing. Perhaps there will be a broader implementation of generative AI in the future as the regulatory framework and the technology itself develops.

Moreover, the findings indicate that AI is starting to challenge established processes of protecting IP, but mainly in operational rather than strategic ways. One concern is the increased volume of patent applications, which several respondents linked to the easier generation of inventions with the use of AI tools. This development may complicate the identification of prior art, making it more difficult to determine whether an invention is new. This may then increase the complexity for protecting IP, leading to changes to their strategies and procedures. This reflects the view that Granstrand and Holgersson (2015) present, which emphasizes that technological shifts continuously reshape the way IP is protected and therefore require companies to change their IP strategies.

The findings also show that some believe that several stages of the patent process will be automated in the future. This includes generative AI to draft patent applications and searching among existing patents. By automating stages of the patent process, some respondents believe that it can liberate resources and allow IP departments to focus more on strategy rather than repetitive administrative tasks. This can increase the efficiency within IP departments, which in turn can allow companies to reallocate resources to other departments or focus on generating more IPRs within the IP department. Teece et al. (1997) highlights the need for firms to be able to sense, seize and reconfigure resources in response to changing environments in the dynamic capabilities framework, which aligns with the findings discussed above. Therefore, it would be of interest for further research to explore the possible strategic changes that companies might face in the future as the technology advances and the environment for firms keep changing.

Although some stages might be automated, Lizarralde and Contreras (2022) explain that AI cannot replace a human patent searcher since AI lacks the capability of understanding literature. This is a necessary trait in order to interpret patents, since it requires specialization in detecting similarities between different patents, which somewhat contradicts the result previously discussed. As of now, the technology still requires a human patent engineer to be a part of the patent process. It will probably take time before, or even if, a patent engineer can be replaced by AI.

5.2 AI's Impact on Innovation Processes

With the advancement of AI, companies are shifting how they work with the innovation process. AI has become an increasingly important tool in this regard, particularly within R&D, i.e. the first two phases of the innovation process. This is primarily because it is accelerating the R&D process. As presented before, many respondents said that they are increasingly using AI in the R&D process. This is mainly due to AI enabling better data modelling and enabling them to interrogate their own data. This aligns with the observations of Brem et al. (2023), who highlighted that AI could streamline the process of analyzing information. This acceleration of the innovation process could potentially lead to more inventions, i.e. IPs. In addition, this could also enhance patent trolls' abilities to create large patent portfolios, resulting in legal challenges for companies. However, this acceleration could potentially also place a big pressure on the IP departments, which could result in some

IPs not being managed. That in turn could lead to risks where inventions which are appropriate to patent are not, leading to missed opportunities. This could then necessitate more established internal procedures for prioritizing which inventions get patented and not.

Further, an additional theme that emerged is the potential for greater integration between IP and R&D departments. Respondents mentioned that AI could potentially identify areas in need of innovation, relating to the idea generation phase of the innovation processes. Additionally, tools that automate steps of the patent creation process could be used by R&D departments in connection with their ideation processes, placing some IP tasks relating to the implementation phase described by Utterback (1971) on the R&D department. This could potentially further streamline the patent process and save resources for IP departments. Tools that aid in identifying innovation gaps, as described by Brem et al. (2023), could also be utilized by R&D departments, further increasing their alignment and integration with IP departments since it allows R&D to more actively take part in several of the IP commercialization steps described by WIPO (2025). Increased integration could not only save resources that are otherwise spent on communication and alignment between departments, but also further integrate the innovation process with the IP commercialization process.

On the other hand, some companies are more skeptical toward the potential of increasing integration. An explanation for this could be that differences in AI maturity play a significant role in shaping these perceptions. Companies that have more advanced AI capabilities and deeper integration of AI tools across departments may experience greater synergies between IP and R&D. As AI supports iterative patent processes, rapid data analysis and targeted innovation searches, these companies are better positioned to align IP protection closely with R&D activities. In contrast, companies in earlier stages of AI adoption might encounter challenges in the coordination between IP and R&D, which can explain the difference in how the respondents viewed this possible development.

Another interesting topic that occurred was the evolving relationship between OSI and R&D. As previously mentioned, one respondent emphasized the strategic value of OSI, especially in using open datasets. This allows researchers to use their dataset as a standard, enabling them to leverage the results gathered from the researchers. However, this perspective somewhat contrasts with the view of Holgersson et al. (2024), who suggests that AI could reduce the need for external collaboration by automating idea generation. The respondent's emphasis on OSI makes it clear that, at least in this context, the usage of external resources is still highly valuable in R&D, i.e. in the first two phases of the innovation process described by Utteback (1971). The results also suggest that AI could lead to more collaboration, especially when companies lack internal expertise, further arguing that external resources are still valuable. Nonetheless, Holgersson et al. also acknowledge that AI has enabled OSI, which partially aligns with the respondent's viewpoint. What remains unclear is whether AI has influenced the use of OSI or not. It could therefore be interesting to further research the relationship between OSI and AI.

5.3 Changing Conditions for IP Protection

The results indicate that AI might make it easier for patent trolls to create large numbers of patents, which could result in more conflicts and lawsuits about patent rights. As discussed by Ramalho (2018), AI might give rise to low quality patents and consequently it might be

necessary to consider changes in both patent laws and patent policies. In connection with the increased number of lawsuits, companies may be forced to allocate significant resources to manage these infringement claims and legal disputes that are initiated by patent trolls. A possible consequence of this could be that companies will have less time and resources to invest in critical business areas, such as R&D, which will impact the company as a whole as well as their overall value offering. These developments align with Al-Aali and Teece's (2013) view, who highlight the need for strategic alignment between IP management and evolving technological and market conditions.

Some respondents raised concerns that the IP system could become overloaded because of patent trolls, which would reduce its effectiveness in protecting innovations. The respondents also highlighted how strategic risks associated with patent trolls could occur, because of how they can exploit the IP system in unfair ways. This underscores the importance of developing dynamic capabilities, as described by Teece et al. (1997), who suggest that firms must be able to adapt and reconfigure their resource base, including IP protection to handle the changing environment. Ramalho (2018) further supports this concern, noting that the threat posed by patent trolls has grown the last couple of years, as a result of AI's ability to shorten the innovation process, especially during the idea-phase. As a result, companies may be forced to shift how they protect innovations and work more defensively in their IP-strategy, for example with trade secrets and strengthened cybersecurity rather than relying only on traditional IP rights like patents. This aligns with what the respondents stated about how they need to develop a more strategic approach in their IP strategy, but on the other hand contradicts what Holgersson et al. (2024) express about how AI implementations will increase the usage of open innovation. With a stronger focus on implementing blocking IPRs, the external transparency will decrease, which prevents knowledge sharing and collaboration between companies.

Further indications of less external transparency have been found regarding protection of AI technology integrated in companies' value offerings. Some respondents discussed using trade secrets as a means of protecting IP containing AI technology. The main argument for using trade secrets is that the AI technology is difficult to reverse engineer and that infringements on it are, because of this, more difficult to detect and pursue. This also means that the disclosure necessary for patenting is hence not considered appropriate. Increased usage of trade secrets aligns with Hemphill's (2004) statement, which also highlights difficulty in pursuing patent infringements as an argument for using trade secrets. The disclosure aspect is also described by Hemphill (2004) and Aboy et al. (2024), the latter discussing difficulties with patenting AI solutions since they might be deemed too generic before disclosing significant amounts of information about training and model architecture. Although this concern was not raised by the respondents, it may still be relevant, as the results do not clearly indicate whether or not they have attempted to seek patent protection for their inventions. Companies might hence use trade secrets due to the risk of rejection or fear of disclosing sensitive technical information. Adding further nuance to the discussion, some respondents did not find it difficult to obtain patent protection for their AI solutions, highlighting the absence of a cohesive perspective on IP protection in this relatively new technological field.

Another aspect emerging from the results concerns the legal uncertainty regarding ownership and inventorship of AI-generated inventions and presents challenges for companies attempting to strategically manage their IP. Some respondents raised concerns that both the increase of patent applications and the use of AI tools to assist IP work could lead to

difficulties in maintaining the current patent system. The current legal frameworks in most jurisdictions only recognize human inventors (Bisoyi, 2022), which creates unclear situations regarding who should be credited or hold rights to inventions, for instance should it be the AI developer or the user deploying the system. As the respondents highlighted, these blurred boundaries not only complicate decisions around patenting, but also raise concerns regarding how future revenues should be distributed when contributions are made by or partly made by AI. As De Rassenfosse et al. (2023) discuss, a differentiated patent system might be needed to address these challenges. This might be considered as more than a temporary legal gap and it may represent a structural mismatch between the current IP systems and how innovation develops. Rather than trying to fit AI into traditional definitions of inventorship, there may be a need for rethinking how authorship and ownership are defined in the context. Such changes might be particularly relevant in light of increasing reliance on generative AI.

The potential impact of increased usage and integration of AI on the broader IP landscape and its systems has also been touched on in this study, but further research delving deeper into these topics would be valuable for this field of research. Regarding the concerns raised by AI-generated works, investigation into whether or not a separate IP system or set of rules is needed for these works is of significance to study. Additionally, it would be of interest to study the effects that decreased entry barriers for patenting could have on the patent system, and whether or not these changes could render it obsolete in its current form.

5.4 IP Strategy

The results show that most respondents do not perceive their IP strategy to have been fundamentally changed by the emergence and increased usage of AI. One potential reason behind this is that their IP strategy is heavily related to their business strategy, which has yet to be significantly affected by AI, and hence their IP strategy is also unchanged. This perception aligns with Grimaldi et al.'s (2021) connection between IP strategy and business strategy.

Despite the perception of unchanged IP strategy, the results reveal underlying changes in how the companies work with IP. Particularly, the results point out the operational areas such as IP protection and commercialization. These changes, while not especially labeled as strategic by the respondents, align closely with broader theoretical definitions of IP strategy WIPO (2025) which emphasize the integration of both strategic and operational tasks. This suggests that a strategic shift may already be underway, even if it is not yet fully recognized by the organizations as the shift is still in an implementation phase, which aligns with Shapero (2025).

In relation to theories regarding strategy the results further point out that companies, through AI, develop a stronger ability to sense and adapt to changing conditions regarding IP, which is similar to the dynamic capabilities framework (Teece et al., 1997). Hence, changes can be viewed as strategic. Further, AI facilitates monitoring of competitors, identification of new technological trends and swift adaptation of IP strategies to secure competitive advantages, which is central in Porter's (1979) discussion that competitiveness must be defended against new entrants. The way the respondents use AI can therefore be said to have changed their IP strategy, however, it does not align with their own definition of IP strategy. This contradiction is a potential area for further research since management of IPs is central for companies within the changing technological environment.

Furthermore, the results show that AI helps companies strengthen their ability to develop and manage intellectual assets that are valuable, rare and difficult to imitate, which are key elements in the Resource-Based view (Barney, 1991), hence the changes can be viewed as strategic. Moreover, firms often focus on more immediate tasks that AI impacts, such as IP protection, licensing, and portfolio management which falls under the two categories operational and legal. This might be due to the stage of the technological shift of AI, as of now, which was described in the theoretical framework by Shapero (2025) who proposes that the shift in this stage primarily leads to operational change. However, the theory regarding IP strategy defines that all the aspects regarding IP are part of the IP strategy and this unseen change might potentially hinder companies striving to sustain competitive advantage, as envisioned by the Resource-Based view (Barney, 1991).

Additionally, the results show that the implementation of AI within the IP field potentially creates increased future agility in how companies strategically manage their intellectual assets. This flexibility is manifested in several ways: more efficient processes, closer integration between IP and R&D, changing protection strategies and a more dynamic adaptation to market changes. Although this potential is speculative, it should be of interest for companies based on the strategic aspects of handling valuable assets within a changing environment, especially according to Barney (1991), Porter (1979) and Teece et al. (1997). The results propose further research of how IPs are going to be managed in the future and since the environment is changing, based on the theory, the strategies should change as well.

6. Conclusion

The technological shift with AI has influenced how companies work with creating, protecting and commercializing their IP, as well as the IP landscape in which they operate. Most companies do not consider their IP strategy to have been affected by the advent of AI though, which could be explained by the fact that the technological shift is still in the implementation stage and has thus not implicitly affected business strategies yet. Since IP strategy is dependent on the business strategy, it is hence understandable that it too has not been significantly affected. Most changes can as of now instead be classified as either operational or legal, with operational changes relating to AI tools which increase efficiency in IP and R&D departments. Legal aspects mainly relate to considerations that have arisen with AI, such as how to handle IP protection of AI-generated IP, as well as the possible risk of infringing on other IPs when using AI generated solutions.

These operational and legal aspects are expected to lead to strategic changes as the technology develops and is further adopted by IP and R&D departments. Automation and increased efficiency as a result of AI tools may lead to enhanced innovation processes and ideation in R&D, leading to larger quantities of generated IPs. Further, lower entry barriers for patent applications might lead to an increase in the number of IPRs created. On a company level this could lead to increased agility regarding companies' IP strategies as they can be more adaptable to changing market conditions.

These possible developments might also lead to challenges, as more IPRs lead to an increase in prior art, adding complexity in securing patent protection. Furthermore, when AI enables easier ideation and creation of patent applications, it increases the risks of patent trolls and blocking patents hindering innovation. Such developments could in extension fundamentally impact the effectiveness of the patent system, and hence how companies choose to protect their IP. Increased usage of trade secrets is one possible outcome, but increased usage of open IP strategies is also a possibility.

Though these concerns are somewhat speculative as of now, they pose important questions about the possible impact that AI could have on how companies create and protect their IPs, as well as the effect on IP strategies and IP systems. As further adoption and development of AI seems inevitable, it is undoubtedly important for companies to understand how to navigate the changing conditions in order to secure their market position and competitiveness as IP remains an important strategic business asset.

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Appendix

Interview Guide 1 (IP Managers)

Introduction

- Could you tell us a bit about yourself and your background?
- What position do you currently hold, and how long have you been in this role?

Business Idea and Value Offering/Business Model, Innovation Process - Background

- We are researching how AI may have influenced your IP strategy. To better understand this, we would first like an overview of your business model
 - What does your value offering look like today?
 - What processes are in place for developing your offering?
 - How does your innovation process work?
 - Do you collaborate with other companies? If so, what type of collaboration?
 - Do you use AI in your business? If so, in what ways?

IP and IP Strategy

- What intellectual property assets do you currently hold, and how do you protect them? Why have you chosen this particular type of IP protection?
 - Do you engage in open innovation?
 - Do you license IP in or out?
- In what situations do you choose not to protect an innovation through intellectual property rights?
- What is your overall IP strategy? Could you summarize how your intellectual assets are strategically aligned with your business model?

AI and IP Strategy

- Has AI impacted your IP strategy in any way?
 - Has it influenced the types of IP you hold, how they are protected, or how they are used?
- Has AI affected your innovation process? (information search, innovation potential, FTO)
- Has your IP strategy evolved in recent years or is it changing right now?
 - Are certain IPs more or less relevant today compared to a few years ago? Why?
 - Has your approach to innovation changed in recent years?

Challenges and Opportunities with the AI-Shift

- Have you identified new opportunities in IP management with the rise of AI?

- What strategies have you implemented to take advantage of these opportunities?
- Have you encountered challenges in IP management related to AI?
- Have you encountered challenges in protecting or managing innovations related to AI?
- Do you find that collaborations or agreements with other companies have become more complex?
- How have you addressed these challenges?

Conclusion

- Is there anything else you would like to add regarding AI and IP strategy?

Interview Guide 2 (IP Consultants)

Introduction

- Tell us a little about yourself and your background
- What is your role? How long have you had it?
- What industry do you work in? Have you worked in any other industry before?

Industries, Trends, Innovation Process

We are interested in investigating how AI may have influenced IP strategies within established global companies.

- What do innovation processes look like within the industry(s)?
- Do the companies you work with collaborate with other companies and if so, how?
- Do companies you have worked with use AI in their operations and if so, how?

IP and IP Strategy

- What intangible assets exist within your industry today? And how do companies work to protect them? Why this type of IP?
 - Open innovation?
 - Do companies license out/in?
- In what situations do they choose not to protect an innovation via intellectual property rights?

What is their overall IP strategy? Would you like to summarize how intangible assets are used strategically

AI and IP Strategy

- Do you see that AI has influenced IP strategies in any way?
 - Has it affected which IP companies have? How they are protected, IPR? How they are used?
- Do you see that AI has influenced innovation processes in any way?
- Have IP strategies changed in recent years or are they changing now?
 - Are certain IPs more relevant/less relevant today than a couple of years ago? Why?
 - Has your work with innovation changed in recent years?
- If difficult to answer: How are internal discussions about AI and IP strategy going? How has it changed and how do you think it has affected/will affect?

Challenges and Opportunities with the AI-Shift

- Do you experience any opportunities regarding the management of IP in connection with the emergence of AI?

- o What has been the strategy for companies to take advantage of this/these opportunities?
- Are you experiencing any challenges regarding the management of IP in connection with the emergence of AI?
 - o Have the companies you have worked with encountered difficulties in protecting or managing innovations linked to AI?
 - o Do you experience that collaborations or agreements between companies have become more complex?
 - o How have they solved these challenges?

Conclusion

- Is there anything else you would like to add about AI and IP strategy?

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