



**CHALMERS**  
UNIVERSITY OF TECHNOLOGY

# **Beyond the Balance Sheet: Uncovering Intellectual Capital in Acquisitions**

A study of how to strategically manage intellectual capital  
in an M&A process

Master's thesis in Entrepreneurship & Business Design

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# Beyond the Balance Sheet: Uncovering Intellectual Capital in Acquisitions

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## Abstract

In 2021, the global M&As conducted exceeded 62 000. The recent M&A activity has been fueled by intense demand for technology, and for digital and data-driven assets. However, studies show that the failure rate of M&As is between 70-90%. One of the reasons behind the high failure rate has been linked to a lack of identification of intellectual capital in the due diligence phase and to a lacking focus on how to retain it. Intellectual capital is an intangible resource that, in comparison to tangible, it is more difficult both to identify and evaluate. However, when ignoring intellectual capital in the acquisition, which often is the source of the competitive advantage, the firm might not be able to use the assets in an effective way after the acquisition is completed. The role of intangible assets, particularly human- and relational capital, in the success or failure of M&A transactions has received little attention in academic literature.

Through a multiple case study, this thesis investigates how intellectual capital management can impact the outcome of an acquisition of intangible-intensive firms. More specifically, through intellectual capital in the form of innovation-, human-, and relational capital. The study covers the strategic objectives behind acquiring intellectual capital, its associated risks, ways of mitigating the risks, and how to better understand what is being acquired.

The findings in this study show that in order to keep the value of the acquired assets, the acquiring firm needs to avoid the risk of losing the individuals that possess relevant technology-related know-how, R&D capabilities, and tacit knowledge regarding how to manage the relational capital in the form of customers and suppliers. Furthermore, the acquirer of the intellectual capital is subjected to many risks in relation to controlling the intellectual capital, e.g., through intellectual property rights and contracts. In order to mitigate these risks, and several others, the findings in this study show that a proactive approach can positively impact the outcome of an acquisition of an intangible-intensive firm. The proactive approach consists of identifying, evaluating, and managing the intellectual capital earlier in the M&A process. The outlined process consists of four phases, where (1) Utilization, refers to connecting the acquisition strategy with the intellectual capital activities throughout the M&A process. (2) Identification, and (3) Evaluation, refers to an early stage (i) identification and evaluation of the intellectual capital, (ii) its risks and (iii) its control positions related to the strategic objective. (4) Manage, refers to either conducting measures to ensure this before the acquisition is closed or to create a detailed plan of what measures need to be taken after the closing.

Keywords: M&A, Acquisitions, Intangible assets, Intellectual capital, Intellectual capital management, Intellectual assets, Innovation Capital, Human Capital, Relational Capital, Technology, Knowledge, Relationships, Utilization, Identification, Evaluation, Managing



# Acknowledgments

We hope this thesis can contribute to emphasizing the importance of the acquiring firms' handling of the target firm's intellectual capital in an acquisition.

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# List of abbreviations

**EU:** European Union

**M&A:** Mergers and acquisitions

**NDA:** Non-disclosure agreement

**IP:** Intellectual Property

**IPR:** Intellectual Property Right

**R&D:** Research & Development

**SPA:** Share Purchase Agreement

**S&P 500:** Standard's and Poor's 500

**US:** United States of America

# List of key definitions

**Control mechanisms:** The mechanism which controls assets legally, technically, or through business. Includes market power, technical control, right-based control, contact-based control, and secrecy.

**Motive:** The reason behind the acquiring firm making the decision to buy a target firm.

**Intangible asset:** An asset that a firm possesses that is not in a physical form.

**Intangible intensive firm:** A firm that to the largest part consists of intangible assets, not tangible assets.

**Intellectual capital:** The unique set of intangible assets that a company possesses. Includes innovation capital (technology), human capital & relational capital.

**Intellectual property:** Property that is the result of a creation in the mind such as inventions and literary and artistic works which are legally protected through intellectual property rights such as patents and copyright.

**Tangible asset:** An asset that a firm possesses that is in a physical form.

**Technology:** Technical inventions as part of innovation capital

**Public information:** Information regarding the assets that are available from data that is disclosed, or available publicly for example through an agency or a database. For example, patent databases.

**Strategic objective:** The general strategic reasoning of a firm when acquiring target firms.

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# 1 Introduction

## 1.1 Background

In the Industrial Society, companies focused on creating tangible assets, as these were seen as the most valuable. However, when the paradigm shifted, and the world moved into the Post-Industrial Society, there was a shift in focus to developing intangible assets in the form of knowledge and services (Bell, 1967). This was the start of the Knowledge Economy that companies are operating in today. In order to add disruptive or innovative technology, to achieve a competitive advantage in the market, companies must choose between two different strategies: internal development or acquiring a firm with the technology. For industrial-born companies, the rapid technology development, especially in the high-tech sector, either the internal IP development is too slow, or the internal capabilities are insufficient to compete effectively in the market (Bryer & Simensky, 2002). The acquisition of a firm to add new technologies to its pre-existing technology base is seen as an efficient way to grow (Kumar, 2019). Acquisitions have thereby become a popular tool to acquire technology externally in order to compete (Bryer & Simensky, 2002).

Technology acquisitions have been on the rise with an increase of 525% between 2011 to 2016 (Rimmer, 2018). Technology deals accounted for nearly 20% of all M&A transactions in 2016 (Kengelbech et al., 2017). More interestingly, around 70% of those acquisitions are being made by non-traditional technology companies, pointing towards increasing importance for technology acquisitions ranging from diverse industries. In combination with this, Mousavi (2011) argues for three significant intellectual property trends that can be seen as the drivers for an M&A deal-making change. The first driver is the dramatic increase of intellectual property as a percentage of the market values of global companies today. Looking at S&P 500 companies, the intangible market value as a percentage of total market value increased from 17% in 1975 to 90% in 2020 (Ocean Tomo, 2020).

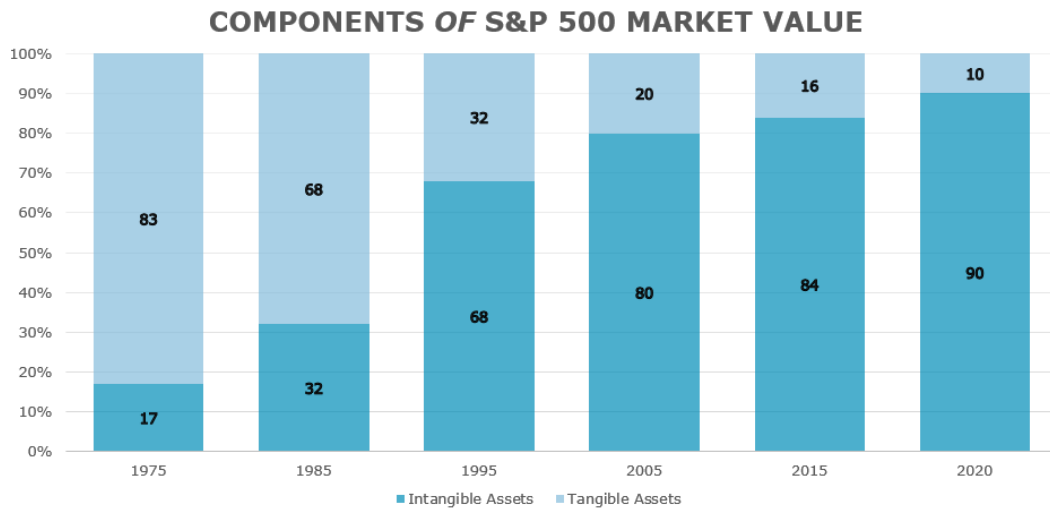


Figure 1: Components of S&P 500 market value (Ocean Tomo, 2020)

Whether the intellectual property resides in the trade secrets of a source code, a patent portfolio, or a brand, it is now often the most significant asset in an M&A transaction (Mousavi, 2011). The second IP trend is the increased liquidity in the market for buying and selling patents. Non-practicing entities (NPEs) and increased patent litigations have driven companies to adopt new strategies to address their patent exposure, and both acquirers and targets are more frequently starting to view patents as having an independent value from the business of the target firm. The third trend is the increased availability of more robust patent valuation methodologies, giving the acquiring firm a better opportunity to consider the value of the patents held by the target in their evaluation and overall strategy for the acquisition. Overall, these trends can now start to influence the strategic considerations of acquisitions and enhance the due diligence process in evaluating the value and risks related to the intellectual property owned by the target in an M&A.

## 1.2 Prior research

A literature review was conducted in order to set the scope of this study. In terms of research on intellectual capital management, there had been a lot of previous research. Examples of research within this field are *Intellectual Capital* (Brooking, 1996), and *The Influence of intellectual capital on organizational performance—Knowledge Management as moderator* (Ling, 2013). On the contrary, there is a limited amount of research in relation to intellectual capital in an M&A, and none were found specifically on acquiring intangible-intensive firms. Examples of research on

intellectual property in an M&A setting is *Intellectual property management* (Farhadi & Tovstiga, 2010), and examples of intellectual capital in an M&A process is *Mergers and acquisition through an intellectual capital perspective* (Gupta & Roos, 2001). In this field, there is a gap in research relating to managing human capital and relational capital in an M&A process.

Due to the absence of research on intellectual capital management in the M&A process of an intangible-intensive firm, this study targets the gap in academic research.

### **1.3 Problem statement**

Global M&As conducted exceeded 62 000 in 2021 (PWC, 2022). The M&A activity recently has been fueled by intense demand for technology and for digital and data-driven assets. However, studies show that the failure rate of M&As is between 70-90%. The high failure rate has been linked to a lack of identification of intellectual capital in the due diligence phase and to a lacking focus on how to retain these assets (Lemieux & Banks, 2007). Furthermore, other studies link unsuitable decisions prior to the M&A, the acquiring process, as well as an insufficient integration strategy to failures of M&As (Cartwright & Schoenberg, 2006). Research also shows that there is a lack of an integrated approach regarding the handling of intangible assets in an M&A, where there is a separate evaluation of intellectual property in the legal due diligence process and a separate evaluation of the growth and performance possibilities by strategy advisors (Farhadi & Tovstiga, 2010).

Intellectual capital is often ignored in the due diligence phase, or dealt with insufficiently (Gupta & Roos, 2001). This is due to it being an intangible resource which, in comparison to tangible assets, is more difficult both in terms of identification and evaluation. However, when ignoring intellectual capital in the acquisition, which often is the source of the competitive advantage, the firm might not be able to use the assets in an effective way after the acquisition is completed. Thereby, it might not generate the competitive advantage that was anticipated.

Furthermore, Petrusson (2004) states that the current due diligence models used when acquiring a target firm are created based on the assumption that intellectual capital is a phenomenon that exists in itself and is limited to the documented intellectual property by the target firm. Petrusson (2004) means that it would be useful to have a more sophisticated model to gather information on how the intellectual building blocks have been designed within the target firm and if they can be validated and used to construct innovation.

According to Farhadi & Tovstiga (2010), the role of intangible assets, particularly human- and relational capital, in the success or failure of M&A transactions has received little attention in the academic literature. The collective contribution of all types of intangible assets to value creation following an M&A transaction is also not well understood. This lack of understanding about the impact of intangible assets on M&A transactions represents a gap in current knowledge.

## **1.4 Purpose**

The aim of our study has been to investigate the gap in knowledge of the role of intangible assets in M&A transactions, more specifically technology, and human-, and relational capital. Furthermore, the purpose of this thesis has been to explore how a target firm's intellectual capital can become better understood to know what you are buying, as well as minimize related risks.

The aim of the results of the thesis has been to become a framework that can be used in an initial evaluation of the intellectual capital of the target firm before an acquisition.

## **1.5 Research questions**

### **Main research question**

*How can intellectual capital management impact the outcome of an acquisition of an intangible-intensive firm?*

### **Sub-research question 1**

*What are the strategic reasonings behind acquisitions of intangible intensive firms?*

In order to be able to understand how intellectual capital impacts the outcome of an acquisition, we first need to understand what the acquiring firm is targeting with its acquisitions and the overall strategy behind it.

### **Sub-research question 2**

*What are the risks associated with acquiring intellectual capital and how can it affect an acquisition's success?*

The second sub-research questions aim at understanding the risks associated with acquiring intellectual capital and its relation to acquisition performance. In order to understand the role of intellectual capital and how it affects acquisition outcomes, the different risks with acquiring intellectual capital and reasons why acquisitions succeed or fail must be explored.

### **Sub-research question 3**

*How can intellectual capital be managed in the acquisition process before closing?*

The third sub-research question aims at understanding how intellectual capital in an acquisition context can be better understood and what can be done, and when, to mitigate and raise awareness of the risks.

## **1.6 Delimitations**

The intellectual capital that will be analyzed in this study is technology, human capital, and relational capital. Thereby excluding other categories within intellectual capital management.

This study is made from the acquiring firm's perspective, hence how the acquiring firm should handle the target firms' intellectual capital, and what risks and control positions should be considered. The target firm's perspective is not part of the study.

Furthermore, an M&A process consists of several different phases where a preliminary phase, a transaction phase, and an integration phase are the overarching ones (Farhadi & Tovstiga, 2010). The phase that will be focused on in this research is the preliminary and transaction phase while excluding the integration phase.

Due to limitations in the time and scope of this study, as well as a limit in the number of intangible-intensive acquisitions to study through interviews, the study was limited to seven acquisitions. Also, since the scope of the study regards intangible assets in acquisitions, the studied cases have been limited to acquisitions that have been intangible-intensive.

Only acquisitions in the form of a share purchase are within the scope of research. Acquisitions of assets and liabilities are thereby outside of the scope.

## 2 Theoretical Framework

This section explains the key theoretical concepts and theoretical processes that have been used in the analysis section of the thesis. The section is divided into four subheadings. In 2.1 theory related to the firm's assets will be outlined. In 2.2 M&A theory is used to explain the acquisition including motives, types of acquisition, acquisition phases, and success and failure. In 2.3 theory relating to intellectual assets, intellectual capital, and intellectual property are presented. Lastly in 2.4 theory related to the control of these assets is explained.

### 2.1 Resource-based view and Knowledge-based view

#### *Resource-based view*

Resources are described by Barney (1991) as including “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness”. Instead of arguing of sustained competitive advantage that is dependent upon time, Barney (1991) argues that sustained competitive advantage lies in the inability of both current and future competitors to duplicate one's strategy that makes the firm competitive. In order to understand this, the author uses a theoretical model where firms' resources must have four different attributes to sustain a competitive advantage: “(a) it must be valuable, in the sense that it exploits opportunities and/or neutralizes threats in a firm's environment, (b) it must be rare among a firm's current and potential competition, (c) it must be imperfectly imitable, and (d) there cannot be strategically equivalent substitutes for this resource that are valuable but neither rare nor imperfectly imitable”. In sum, a resource needs to be *Valuable*, *Rare*, *Imperfectly imitable*, and *Non-substitutable* to enable sustainable competitive advantage.

When applying the resource-based view to acquisitions in particular, the emphasis is placed on resources both as the motivation behind growth through acquisition, but also as dictating the direction (Hitt, Harrison, Ireland & Best, 1998). Hitt, Harisson, Ireland & Best (1998) illustrate this in three ways. Firstly, through a firm that inhabits a specific resource that can be used in an acquisition for growth. Secondly, through acquiring a

business and using its core resources in this firm to achieve economies of scope. Thirdly, acquisitions can be used to add core resources or to combine its core resources with the resources of the target firm to make the core resources less imitable.

#### *Knowledge-based view*

The knowledge-based view is built upon several pre-existing theories, including the most influential one, the resource-based view. It focuses on knowledge as a critical resource that becomes important in terms of sustainable competitive advantage (Grant & Phene, 2022). It is being characterized as an especially important resource for sustainable competitive advantage because of its “potential for replication, complementarity among different types of knowledge (supermodularity), and propensity to appreciate rather than depreciate with use”. Knowledge is also highlighted by Grant & Phene (2022) because of its potential of transferring, transforming, and integrating into firms' processes as well as an organizational capability.

The knowledge-based view has been closely linked to the economic changes in the last two decades resulting from the acceleration in the accumulation and availability of knowledge (Grant, 2006). In terms of resources, this “new economy” has become more dependent on knowledge as well as intangible resources rather than tangible ones. In terms of the transferability of a firm's resources according to the resource-based view, it is seen as one of the critical components for a firm to sustain competitive advantage (Grant, 1996). In regard to knowledge, there lies an important issue of transferability, both within a firm and between firms. Grant (1996) identifies a critical distinction between two types of knowledge, tacit and explicit, which lies in the transferability and the mechanisms for the transfer between individuals as well as across space and time. In addition to that, easier transferable assets are seen as a critical component for a firm's competitive advantage, Barney (1991) also points out that highly tacit and socially complex knowledge can be seen as a valuable competitive asset since it is very difficult for other firms to imitate.

## 2.2 Firms acquisitions

### 2.2.1 Motives and strategies for acquisitions

The overarching reasons for firms using acquisitions as a strategic tool are to promote future growth and build sustainable value (Calipha, Tarba & Brock, 2010). Resulting from the globalization of businesses, competition between firms has increased (Hossain, 2021). In order to stay competitive, and build for future growth and sustainability, M&A has become one of the most integral parts of achieving this. In the literature, there are several different motives for the acquisitions firms make.

Hitt, Harrison & Ireland (2001) have analyzed previous merger waves to pinpoint the motives behind the acquisition. The 1980 merger wave was focused on core business as well as related businesses, the 1990s were instead focused on economy of scale and scope, as well as market power. Furthermore, they state that acquiring new innovation and introducing it rapidly as well as complementary resources, as other reasons for a firm to acquire. With complementary resources, the resources in the acquiring firm and target firm are different but mutually supportive. The four following reasons for a firm to conduct an acquisition are stated (1) firm growth (2) increased market share (3) economies of scale & economies of scope (4) reduced expenses including knowledge transfer & elimination of duplications.

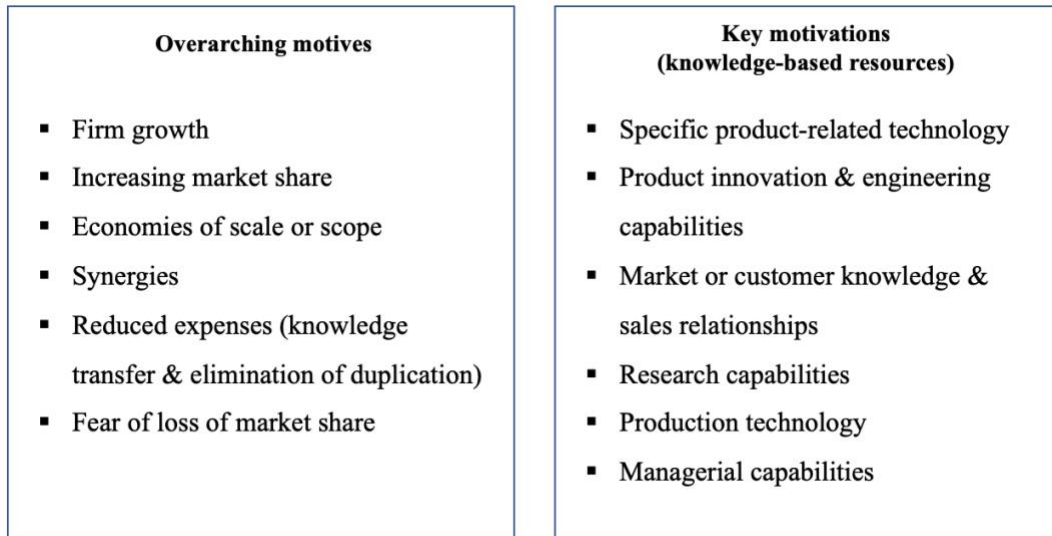
Kumar & Sharma (2019) state three motives behind acquisitions. Firstly, financial nature, which is defined as acquiring to increase the number of assets or increase the profit. Secondly, management intention, which is defined as the management of a firm's interest in a specific business. Thirdly, fear of loss of market share, which is related to fears of losing market share either to a competitor in the market in which the firm operates or a market that the firm is aiming to operate in.

Calih, Tarba & Brock (2010) account for five motives behind mergers and acquisitions (1) expand the product line or complement products or services (2) Market power (3) Increase market share (4) Invest for risk diversification (5) Synergy. Furthermore, they refer to two categories of strategy: concentration strategy & diversification strategy. Concentration strategy is further sub-categorized into *vertical growth*, which is

described as the firm growing vertically in the value chain, and *horizontal growth*, which is described as the firm growing horizontally in the same location of the value chain. Diversification strategy is also sub-categorized into *concentric diversification*, where the growth targets a related industry to the acquiring firm to create synergy effects, and *conglomerate diversification*, where the growth targets a previously unrelated industry to create financial gains.

Hossain (2021) states five expected outcomes to boost firm performance through acquisitions. (1) synergy (2) market control (3) improved competitiveness (4) integration of management strategy (5) diversifying risk. Furthermore, the synergies through financial innovation capabilities are stated as most important to drive acquisition. Synergies also cover some common motives which are stated as for example economies of scope/scale, increase of market share, or diversification (Kumar and Sharma, 2019).

Mark Sirlower views the initial strategic vision as the cornerstone in all effective acquisitions and Warren Hellman argues that the deciding party of the acquiring firm must show that the acquisition will provide the intended positive outcomes, otherwise an acquisition should not be made (Hitt, Harrison & Ireland, 2001). Hence, both refer to the reasons why a firm acquires a target firm, as an imperative part of a successful M&A transaction. In regard to intangible assets, Gupta and Roos (2001) state that they increasingly have become the main motivation behind acquisitions. Firms that seek to acquire technology, knowledge, and/or strategic capabilities for synergy effects, are given a unique opportunity to learn through their acquisitions as they expand their business outside the scope of their original context. Ranft & Lord (2002) conducted a study where the primary knowledge-based resource was the motivation behind acquisitions. Six main motives ranked from most common to least common were (a) specific product-related technology, (b) product innovation and engineering capabilities (c) Market or customer knowledge and sales relationships, (d) research capabilities (e) production technology (f) managerial capabilities.



*Figure 2: Summarizing model on motives and key knowledge-based resources*

### **2.2.2 Types of acquisitions**

In literature, three common types of M&As are brought forward - Horizontal M&A, Vertical M&A and Conglomerate M&A (Bakher, 2018).

*Horizontal M&As* refer to when the acquirer and the target firm engage in similar fields (Gupta, 2012). The motives behind horizontal M&As are mostly to decrease the competition in the market, which in turn increases the acquirers' market power (Bakher, 2018).

A *vertical M&A* involves bringing together two firms that have a buyer-seller relationship and are involved in different stages of the value chain (Gupta, 2012; Bakher, 2018). A vertical M&A can either be backward or forward, which refers to when a manufacturer acquires one of its suppliers or when acquiring a firm that purchases its products.

*Conglomerate M&As* refer to when the acquirer and the target firm are involved in different sets of activities, products, and/or services to one another (Gupta, 2012). It can also be defined as firms that are completely unrelated, in different geographic locations, or firms that are not in direct competition with one another (Bakher, 2018).

Gupta (2012) also talks about strategic M&A, and financial M&A, which refers to a type of M&A depending on the motives. Strategic M&A refers to the decision to acquire a firm with the motive of gaining synergies. Financial M&A refers to the

decision to engage in an acquisition because of the buyers finding that the price of the target firm has a lower value than the assets of the target firm.

In terms of types of post-acquisition M&A strategies, Rosenzweig (1993) talks about two different dimensions, the degree of interdependence between the acquirer and the acquired (integration), and the need for the acquired firm's organizational autonomy. The author further combines integration and autonomy and puts it into three categories: absorption acquisitions (high interdependence and low organizational autonomy); preservation acquisitions (low interdependence and a high need for organizational autonomy); symbiotic acquisitions (high interdependence and high autonomy). Zhu, Xia, and Makino (2015) argue that the choice between integration and autonomy is a key factor that can decide how successful an acquisition becomes in terms of post-acquisition performance, and thus how much value the two firms' resources combined can create.

### **2.2.3 The phases of an acquisition**

A study conducted by Farhadi & Tovstiga (2010) focuses specifically on intellectual property considerations in the M&A phases. Thereby, the division by these authors can be relevant to use for intellectual capital also. Farhadi & Tovstiga (2010) refer to a division into the following three phases: preliminary phase, transaction phase, and integration phase.

The preliminary phase is centered around creating a strategy for the acquisition in question, as well as initiating a search for target companies that align with the set strategy. At the end of the strategy phase, the parties sign a non-disclosure agreement, which is a legal contract to ensure that any sensitive information given to the acquiring firm becomes public (Sevenius, 2011).

In the final stages of the strategy phase or initial phases of the transaction phase, a legal contract in the form of a letter of intent is signed, which stipulates an intent between the parties to finalize the acquisition. This contract is generally not binding; however, a clause can be included that gives the contract a binding effect (Sevenius, 2011). The transaction phase centers around the due diligence of the target firm, valuation of the target firm, negotiation, and finally a transfer of shares to the acquiring firm. At the end

of the truncation phase, a share purchase agreement (SPA) is signed, which is a binding legal contract that transfers the ownership of the shares from the target firm to the acquiring firm.

The integration phase is after the deal has closed and focuses on integrating the assets into the acquiring firms' organization. However, to create an integrated intellectual property management approach, Farhadi & Tovstiga (2010) have created a framework with the following four phases in the M&A process that are specific to intellectual property: IP strategy phase, IP due diligence phase, IP risk management and integration planning phase and IP integration. When relating these IP-specific phases to the general M&A phases, the IP strategy and IP due diligence phase correlate with the preliminary phase, and the IP integration phase correlates with the integration phase. However, the IP risk management phase spans from the start of the transaction phase further into the integration phase, where IP integration is initiated later and is a shorter phase.

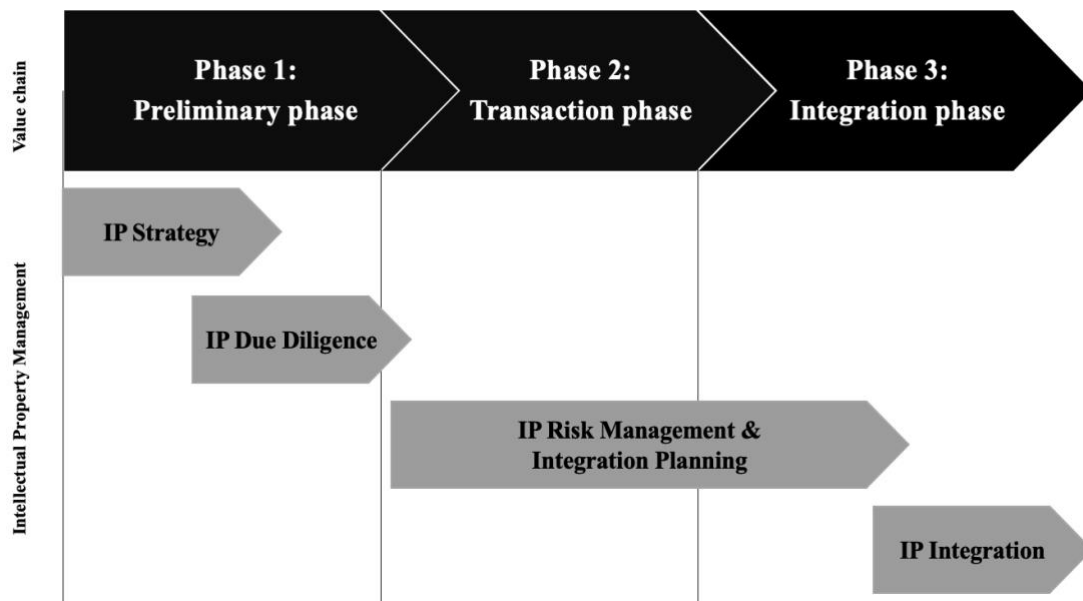


Figure 3: Acquisition phases and IP management (Farhadi & Tovstiga, 2010).

## 2.2.4 Success and failures of acquisitions

In contrast to the popularity of engaging in M&A, they are providing a mixed range of results to the different stakeholders involved (Cartwright & Schoenberg, 2006). An article that covers the most common rationale from previous theories that suggest a successful acquisition is “Attributes of successful and unsuccessful acquisitions of US firms” by Hitt et al. (1998). The attributes that they link to successful acquisitions are covered in three points, which include the following:

- The merged firm achieves greater market power through increased market share or multipoint competition;
- The merged firm gains economies of scale and/or scope by combining complementary capabilities of the two firms;
- The merged firm can access capital at lower costs.

Hitt et al. (1990) argue that the key to a successful acquisition relates to the ability to identify complementarities and act toward achieving positive synergies. Furthermore, they argue based on this, that the complementariness of the resources is of greater importance than the product or market relatedness of the target firm. Firms that are able to achieve this through their acquisitions are then more likely to be acquiring successfully through gaining economies of scale and/or scope, relating to the second point of Hitt et al. (1998). From an IP perspective, Granstrand & Holgersson (2015) also puts emphasis on identifying complementarities/synergies in order to reach a successful acquisition. Evaluating the respective IP portfolios and identifying the importance of different IPs to achieve the wanted outcome is needed.

Bakher (2018) mentions three dimensions for M&A success - integration success, synergy success, and profitability success. The author argues that an M&A can be considered a success if it leads to both a synergy-, and profitability success and that the challenge lies in managing the balance between the main objectives of the M&A. If only one of the dimensions is achieved, then it is considered to have not reached full success, while if both dimensions are not met, it can be considered a failure.

## 2.3 Asset Categorization

### 2.3.1 Intellectual Capital, Intellectual Property

#### *Intellectual Capital*

A firm can be viewed as a social community inhibiting intellectual capital (Nahapiet & Ghoshal, 1998). There is no consensus in the management literature on the definition of intellectual capital. Nahapiet & Ghoshal (1998) argue that intellectual capital is both a valuable resource as well as a valuable capability for action based on knowledge. They refer to intellectual capital as the "...knowledge and knowing capability of a social collectivity, such as an organization...", further describing it as a valuable resource based on knowledge in the firm. Roos & Gupta (2001) instead describe intellectual capital as the portfolio of intangible resources as well as their transformations. Roos & Roos (1997) have categorized intellectual capital into human capital, organizational capital & customer and relationship capital, while Saint-Onge (1996) divides it into human capital, customer capital & structural capital. Edvinsson & Malone (1998) divides intellectual capital into structural capital, human capital, and relational capital, with subcategories. A subcategory of structural capital that is of interest based on the scope of the study is organizational capital, which includes innovation capital which includes both creation of innovation, and intellectual property. Thereby, technical innovations are included in the subcategory innovation capital.

Finally, the subcategories of intellectual capital used in this study are (1) Innovation capital (furthermore referred to as technology) (2) Human capital (3) Relational capital

#### *Intellectual Asset Management Framework*

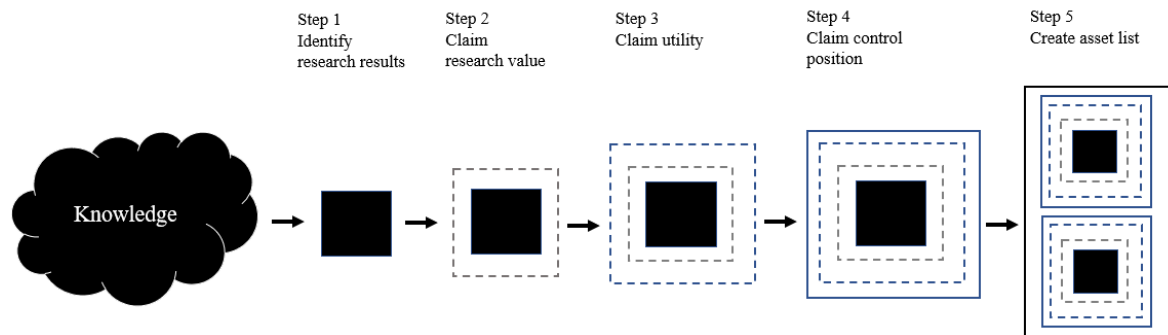
A significant component of this research is identifying and evaluating intellectual assets. The IAM framework aims to make intangible assets manageable, the framework is constructed as a support system for university research results. However, it is also suitable as a support tool for a firm to handle its internal assets. Petrusson (2016) focuses on two types of intellectual assets: knowledge assets and intellectual property assets, where the former is an objectification of valuable research results and the latter a control dimension connected to the assets relating to the right of use of the asset.



*Figure 4: The Intellectual Asset Management Framework by Petrusson (2016)*

There are four processes in the IAM framework for managing research results: (1) Claiming knowledge assets and intellectual property assets (2) Evaluating and positioning assets in the external environment (3) Deciding utilization for the assets (4) Organizing knowledge assets, intellectual property assets and contracts within the organization, see Figure 5. The starting point is the accumulated research results that exist in the firm, this can be described as a cloud of all possible research that exists. The focus of this research study is the identification and evaluation of intellectual assets in the initial phases of an M&A process, where the focus is on the effective use of intellectual assets of the acquiring firm. The relevant parts of the IAM framework for this purpose are Claim, Position, and Utilize, hence these parts will be described in the theory section.

## Claiming knowledge assets and intellectual property assets



*Figure 5: Visualization of the claiming process by Petrusson (2016)*

The claiming part of the assets consists of five different steps according to Petrusson (2016), see Figure 6.

In the first process these research results should be identified, this comprises of identifying knowledge assets as research results, based on what assets can create value for the firm, in order to create an asset list of all the firms' valuable resources. To make this process manageable in a systematic way, a model that categorizes research results has been developed as part of the framework (Petrusson, 2016), see Figure 7. This categorization can thus be used to identify valuable resources within a firm and is thereby useful to identify intellectual assets in an M&A context. After the identification, the research value can be claimed by describing the value of the research, hence objectifying the assets semantically. Furthermore, the value should be analyzed based on the uniqueness and importance of the asset, what value the asset has in future processes, etc. (Petrusson,2016). Then the utility and/or usage of the asset should be described based on how the asset can be used and what benefits the asset can be for the organization in question. The fourth step of the claiming process is claiming control of the research result including intellectual property assets, which will be further described in Figure 7. Finally, the asset list can be prepared where the information of the steps above should be included. Furthermore, the actors connected to the specific assets e.g., an inventor or collaborator, should also be included in the asset list.

Table 1: Claiming process - an adaptation of Petrusson (2016)

Research result	Description	IPR Asset
Data	Knowledge asset in the form of unstructured information e.g. raw data, survey data, documentations	
Database	Knowledge asset in the form of collected data that has been structured and organized systemically making it searchable e.g. spreadsheet, table, electronic database	Protected databases & database rights
Observation	Knowledge assets in the form of conclusions based on analysis of empirical data collections and other analytical processes e.g. trends & correlations based on a study	
Theoretical framework	Knowledge assets in the form of theories that describe phenomena, causes & relationships e.g. organizational theory, models	
Solution	Knowledge assets in the form of a creative scientific solution to a scientific problem e.g. technical invention, pharmaceuticals	Patentable inventions, patent applications & patents
Visualization	Knowledge assets in the form of static or dynamic visual presentation beyond a easy drawing e.g. prototype, simulation model	Protectable designs, protected designs, application for design protection, registering for design protection
Instruction	Knowledge assets in the form of concrete instructions giving practical guidance on how to carry out a certain activity e.g. algorithm, routine	
Software	Knowledge assets in the form of computer features or functions based on an implemented and organized dataset and having an automated operation that perform certain tasks e.g. platform, application	
Narrative	Knowledge assets in the form of a coordinated case study, empirically demonstrable account or narrative e.g. literature, compiled interviews	
Creation	Knowledge assets in the form of creative and artistic creations e.g. music, art, painting	Copyright protected literature, art & copyrights

### Positioning and evaluating assets in the external environment

The second step focuses on positioning the organization in the external landscape, the basis for this is understanding the external landscape and other external relevant factors. The first step of this process is to explore what other actors are pursuing in terms of research, collaborating, or using products or services in the same field as the firm (Petrusson, 2016). By doing this a roadmap can be created both in terms of research fields, utilization fields, and the IP landscape that the firm is moving within. This can be done by creating three different maps, a research map, a utilization map, and a control map.

Firstly, the knowledge fields need to be identified and by doing this a knowledge tree can be created, this includes pinpointing the relevant research and utilization fields and positioning the fields in relation to each other. Secondly, determining what research is relevant for each research field and utilization fields, and thirdly, evaluating how research and innovation processes relate. When this is finished a knowledge tree can be created, which allows for mapping or landscaping of the firms' own position within them, to lastly identify and position other important actors within these fields. This allows for an analysis of the competitors within the same fields and how they are positioned in relation to the firm in question. Through this, the firms' competitiveness and vulnerability in different knowledge fields can be visualized, as well as what can be improved for better utilization of the assets that the firm possesses.

Finally, the IP landscape can be visualized by characterizing the knowledge fields from a control position point-of-view. This can be done by investigating what parts of the field are subject to patents, copyright, and other intellectual property and what assets are covered by confidentiality. This allows for an analysis of what part of the field the firm can operate freely and where it cannot due to the control positions of other actors within the field, hence mapping the actors with the most important control positions and the firms' own control position within the field. This can be used to determine how the firms' control positions can be utilized and how the control positions can be developed.

### **Deciding utilization for the assets**

Based on the roadmaps created in the positioning step, according to Petrusson (2016) the firm can decide how the knowledge assets and intellectual property assets should be utilized, focusing on what part of the fields the firm has the most potential. This should be based on what internal resources and capabilities the firm possesses, also considering what obligations the firm already has and what restrictions there are internally and externally. Through this process, utilization options for the knowledge assets can be determined.

### **2.3.2 Human Capital**

According to Nahapiet and Ghoshal (1998), human capital encompasses the knowledge, skills, and abilities that enable individuals to act in novel ways. Since skills and abilities are based on knowledge, the focus of this section is to explain and categorize knowledge within a firm.

Marshall describes knowledge as our most powerful engine of production (Nahapiet & Ghoshal, 1998). Furthermore, Drucker (1993) held that knowledge should be regarded as the primary resource of a firm and sees it as an important contribution to its competitiveness. In the knowledge economy where there has been a shift from labor-intensive to knowledge-intense work, Drucker views intangible resources, skills, and experiences as the primary drivers of the economy, whereby knowledge can be regarded as a product in itself or a tool. Furthermore, knowledge is inherently connected

to the person that possesses it and can thereby not be “specified and communicated independently from the possessor of the knowledge” (Ranft & Lord, 2002).

There is a lack of consensus in the literature regarding the description of knowledge. Liebeskind (1996) refers to knowledge as “information whose validity has been established through tests of proof”. Through this description, knowledge includes both codified and tacit knowledge but does not include opinions, beliefs, or otherwise unproven facts. Nonaka et. al. (1996), similarly describes knowledge as a significant set of knowledge that encompasses both a verified true belief and practical expertise.

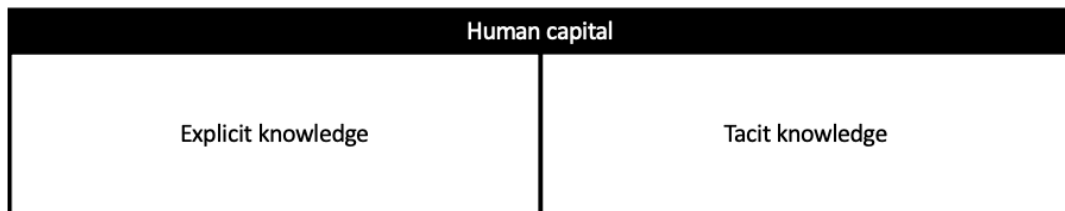


Figure 6: Visualization of knowledge representation

Polanyi (1958) has identified two representations of knowledge, tacit and explicit, see Figure 8. Nonaka et. al. (1994), states that explicit knowledge only expressed in words or numbers is “the tip of the iceberg of the entire body of possible knowledge”. Explicit knowledge is described as such knowledge which can be communicated through formal or systemic knowledge e.g., technical information or material properties. Tacit knowledge is personalized to its nature which makes it difficult both to communicate or systemize, e.g., technical skills. This allows for knowledge to be regarded either as an *object* if it is explicit, but also as an *action* if the knowledge is tacit. Furthermore. Polanyi (1958) holds that humans only can possess tacit knowledge but can transfer it into explicit knowledge through communication. Wong & Radcliffe (2000) defines tacit knowledge as “not openly expressed or stored, but implied; understood, inferred” which is visual through the actions of individuals, and explicit knowledge as knowledge that can be expressed clearly, shared openly, and documented. Nonaka & Takeuchi (1995) hold that tacit knowledge exists in the human brain and is not readily capturable or codifiable. Polanyi (1958) argues that tacit knowledge cannot be seen through what an individual knows per se, instead tacit knowledge is visible in the action that an individual takes.

Brookings (1996) speaks about work-related knowledge, which is divided into explicit and tacit or implicit knowledge. Explicit knowledge is described as such knowledge that is well organized in the mind to the extent that it can be codified, for example, an operating manual for a franchise. Tacit knowledge is explained as knowledge that can be used by individuals but is extremely difficult to codify, thereby it is hard to write it down. Implicit knowledge is instead described as knowledge, which is hidden in operating processes, and is carried by employees that are knowledge-rich and thereby it is difficult for novel personnel to learn this type of knowledge.

Conclusively, there are three types of categories of knowledge that are important: *Purely tacit knowledge*, where the individual in possession of it is imperative for its usage. *Purely explicit knowledge*, where the knowledge can be used when written down. *Implicit knowledge or hybrid* where the explicit knowledge is more valuable for usage in combination with tacit knowledge that a certain individual possesses. This is illustrated in Figure 9.

Human Capital		
Knowledge that can be written down and transferred	Knowledge that can be written down and transferred but the person adds more value	Knowledge that cannot be objectified, thereby the person is needed

*Figure 7: Knowledge classification*

Nonaka (1991,1994) holds that knowledge ranges from explicit to tacit along a continuum, otherwise stated as varying in tacitness. Tacit knowledge can be accessible by others if it leans towards the explicit side of the continuum. Grant also refers to knowledge as varying in its transferability, stating that explicit knowledge can be easily transferred both between an individual and a firm but also between individuals, while it is possible to transfer tacit knowledge between individuals, but it is both slow and at high cost (Grant, 2006). The possibility of transferring knowledge also depends on the absorptive capacity of the party that is receiving the knowledge, or in other words the

ability of the recipient to incorporate new knowledge to the pre-existing knowledge. The recipient can be an organization or an individual (Grant, 1996). Leonard, Sensiper & Saviotti similarly hold that knowledge should be placed somewhere on a spectrum where it is completely tacit on one end and completely explicit on the other end (Wong & Radcliffe, 2000). Furthermore, stating that knowledge rarely is either completely tacit or completely explicit.

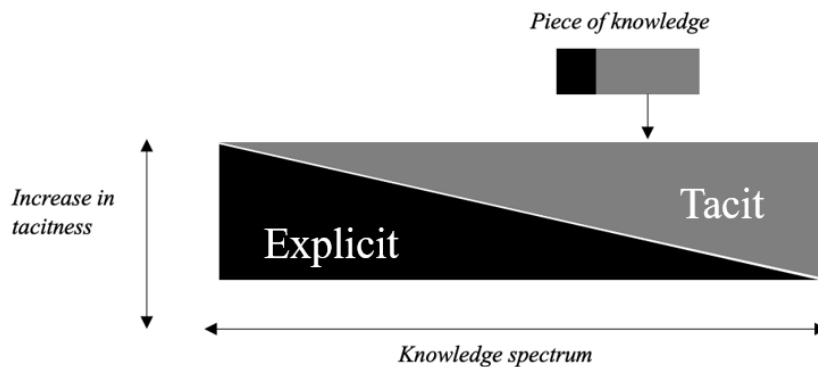


Figure 8: Adaptation of spectrum of tacitness and explicitness Nonaka et. al (1996)

#### *Retaining knowledge within a firm & transferring knowledge*

It is hard both to retain knowledge within a firm and transfer knowledge, due to knowledge being tacit in its nature. However, knowledge can be acquired and retained within the firm Ranft & Lord (2002) argue that acquiring knowledge is difficult but can be achieved successfully through lengthy experience and learning by doing Wong & Radcliffe (2000) hold that retaining knowledge within a firm is difficult, due to the tacitness of it. This is illustrated by design know-how, which can be impossible to recount since the design process requires judgment based on experience where the details cannot be explained in words. This means it is hard to document and incorporate and thereby also retain in the firm.

However, Nonaka & Von Krogh (2009) state that tacit knowledge can be handled by a firm in an effective manner if it is converted from tacit to explicit. Ranft & March (2008) hold that tacit knowledge that cannot be written down restricts a firm's ability to identify and control the relevant variables in order to accumulate knowledge quickly, which restricts the ability to transfer knowledge between two firms. Hence, it will take

a longer time and at a higher cost in an M&A and will also be associated with more uncertainty.

### **2.3.3 Relational Capital**

Ingress - Merino et al., (2014) state that relational capital is one of the components of intellectual capital.

Roos & Roos (1997) describe a framework where relational capital, stemming from intellectual capital, is divided into four categories: *customer relationships capital*, *supplier relationship capital*, *network partner relationship capital*, and *investor capital*. In their article “Impact of Relational Capital on Business Value”, Merino et al., (2014) use the definition of relational capital as “the set of all relationships – market relationships, power relationships, and cooperation – established between firms, institutions, and people that stem from a strong sense of belonging and a highly developed capacity of cooperation typical of culturally similar people and institutions.”. As well as “the knowledge embedded in the relationships with any stakeholder that influences the life of the organization.”.

According to de Pablos (2004), relational capital represents the set of connections that a firm maintains with certain economic agents. The different sets of social connections, for example, interactions with customers, suppliers, strategic alliance partners, shareholders, and administrations, increase the value of the organization (Pablos, 2004). Linking this to a resource-based view of the firm, a competitive advantage can be reached by combining relationships with other resources, increasing their uniqueness (Barney, 1991) ;(Pablos, 2004). This is similarly described by Merino et al., (2014) as “Relationships with stakeholders are the necessary condition for building, maintaining and renewing resources, structures, and processes over time, as firms can access critical and complementary resources through external relationships”.

## 2.4 Control of Intellectual Assets

In “Research and Utilization”, Petrusson (2016) provides a three-step process consisting of 1) describing possible control claims 2) evaluating “degree of control” and 3) determining who has control claims. For the first step of the process, five types of control bases are stated to describe possible control claims: a) Intellectual property rights b) Confidentiality c) Relationships d) Technology, and c) Dependence on an individual. These will each be covered individually in the next section through control mechanisms. To conduct the first step and the second step, the author provides seven example questions to clarify and analyze the asset control positions (see Figure 11). The third step of the process involves determining who has control claims and evaluating the legal claims of various stakeholders. This process concerns the identification of potential legal owners of current and/or future intellectual property rights (ibid). The identification of potential claims may involve financiers, partners, or others who have got any type of right to the assets. Furthermore, potential claims may also involve stakeholders with some form of license to the intellectual property assets.

<b>Questions for describing the assets opportunities for control</b>	<b>Questions for specifying the need for and degree of control over the assets</b>
<ul style="list-style-type: none"> <li>▪ Which assets are patentable, subject to copyright protection, or otherwise controlled by intellectual property laws?</li> <li>▪ Can we dispose of assets without risking infringing on others’ intellectual property?</li> <li>▪ Is it important and possible to argue that the assets include secrets and are subject to confidentiality?</li> <li>▪ Is it possible to control the assets through databases, systems and other technological solutions?</li> <li>▪ Does the opportunity to utilize depend on specific persons supplying the knowledge around the assets themselves?</li> <li>▪ Does utilizing the assets require receiving permission from others?</li> </ul>	<ul style="list-style-type: none"> <li>▪ To what degree is it important to have control over the assets to enable their intended utilization?</li> <li>▪ To what degree can we control the assets without risking infringing on another’s rights?</li> <li>▪ How “strong/comprehensive” are the control positions or possible control positions and what are they based on:               <ul style="list-style-type: none"> <li>– Intellectual property rights</li> <li>– Confidentiality</li> <li>– Contractual relationships</li> <li>– IT systems</li> <li>– Dependence on individuals</li> </ul> </li> <li>▪ To what degree is it clear what claims to rights exist?</li> </ul>

*Figure 9: Clarification & Evaluation of control positions based on Petrusson (2016)*

The result of three processes can then according to Petrusson (2016) be summarized in an asset list where each separate asset is connected to possible control claims, a degree of control, and to who has the claim.

### 2.4.1 Control Mechanisms

Intellectual assets are, in their intangible nature, difficult to control. In order to achieve control over these complex assets, they need to be understood. According to Petrusson (2004) the Intellectual Property and IPRs need to be seen as normative claims in three different arenas (1) the administrative arena (2) the judicial arena (3) the business arena. Built on this logic Petrusson (2004) refers to an innovation that is built upon five categories of control mechanisms in the three arenas that make structural building blocks: right-based property, contract-based property, technical control, secrecy, and market power (see figure 12). Depending on what intellectual assets want to be claimed and what wants to be achieved e.g. blocking others or utilizing productions, claims may need to be made in one area but interact with another arena e.g. claiming secrecy and using contracts.

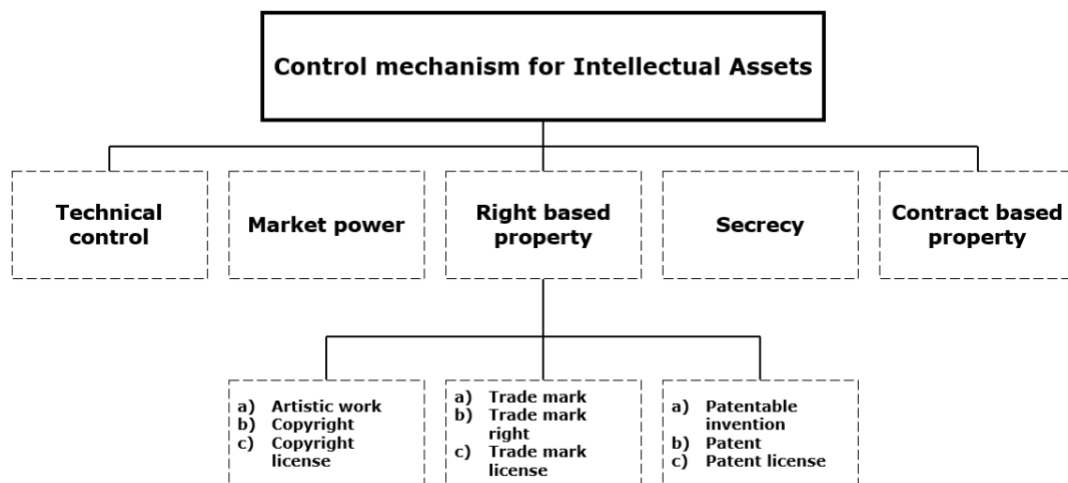


Figure 10: Control mechanisms for intellectual assets by Petrusson (2004)

### 2.4.1.1 Right-based Property

Right-based property is related to Intellectual Property Rights (IPR) assets. Granstrand and Holgersson (2015) define IPR as “a legally codified right created and used to assign ownership to intellectual resources such as knowledge, technologies, brand names, and other types of intellectual creations.”. They further define the family of IPRs as including “patent rights, copyrights, design rights, trademark rights, trade secret rights, and some other types of ancillary rights.” (Granstrand & Holgersson, 2015). Petrusson & Heiden (2009) regard assets as a valuable object, and property as a trusted object of commercial application, where the latter is trusted if the ownership of the assets is stated in the judicial system and used and accepted by market actors and the public. Petrusson (2016) legally objectifies the categorized knowledge assets, see 3.3.2. Petrusson also separates the knowledge asset from the intellectual property assets, which is based on said separation of assets and property. For technical inventions specifically, this is done by identifying and qualifying patentable inventions, copyrightable literature, and art, database protection, design rights & trade secrets according to the legal act that regulates the protection of these mentioned assets. Hence, when the legal criteria are fulfilled, they are considered to be IPR assets. Petrusson (2016) also include patent applications, and trademark application as “meta-objects” which are also regarded as IPR assets.

For these assets, an intellectual property right can be granted to the inventor or the employer, which gives the right holder decisive claims to the usage of said property (Alchian, 1989; Segal & Whinston, 2013; Spinello, 2007). Intellectual property rights differ from traditional property rights, in the sense that the rights are to intangible assets, which are abstract objects (Spinello, 2007).

Copyright protection awards a set of rights to the copyright holder, it provides an exclusive right to reproduce the copyrighted work (Spinello, 2007). These rights are stipulated in national legislation, which in Swedish law is done through *lag (1960:729) om upphovsrätt till litterära och konstnärliga verk*, and in U.S law is regulated in Title 17 of the United States Code. However, copyright acts are similar globally, for example, through nations signing the Berne Convention (Nimmer, 1992). In a digital

invention, the knowledge assets that can be protected are code & algorithms used in the software.

Patent protection grants the innovator a right to exclude others for a twenty-year period from using, producing, or selling the invention without the right holders' permission (Spinello, 2007). A patent is granted in the EU if the following criteria are fulfilled (1) the invention has a technical character (2) the invention is novel (3) the invention includes an innovative step (4) the innovation has an industrial applicability (Article 52,56 EPC). The main difference in the U.S. patent act is the possibility to patent software. The European Patent Convention (EPC) only grants rights for technical inventions, however in the U.S. the focus of Title 36 USC §101 the patentability is focused on the utilization (Laub, 2006). Furthermore, in *Gottschalk v Benson* the U.S. Supreme Court addressed Software patents for the first time, then the *State Street Bank* decision further addressed that the practical utility of the subjects decides the patentability. Thereby, there is a possibility to patent software in the U.S., compared to in Europe where it is not. Furthermore, a patent license also grants various rights to exclude the license holder, which by Petrusson (2004) is considered a right-based property.

Petrusson (2016) considers trade secrets to be an IPR asset, however, he states that this is not a certainty, since it does not give the right to exclude others in the same way that patents and copyright do. Instead, trade secret assets are protected objects and, if used, there is a possibility to intervene. This right is established in the Swedish Trade Secret Act, and in the Defend Trade Secrets Act (DTSA) in the U.S. Thereby when the criteria in a legal act regulating trade secrets are fulfilled, an IPR asset exists in the firm. However, Petrusson (2004) separates secrecy-based control from right-based control in his framework.

Conclusively, the firm has control of IPR assets by excluding other actors from using, producing, selling, or reproducing the asset that is protected. Hence right-based property is controlled by the firm through the control mechanisms established in the above-mentioned legal acts. Furthermore, IPR-based control over intellectual assets has been shown to have a positive effect on a firm's innovation and economic growth (Cho & Kim, 2017).

### **2.4.1.2 Contract-based Property**

A contractual agreement is a tool that the firm can use both to establish relationships and for transactions of intellectual assets between actors (Petrusson, 2004). Contracts allow control both internally e.g., through shareholder agreements and employment agreements but also externally through license agreements, supplier agreements, and strategic alliances (Petrusson, 2004).

A big part of creating innovation lies in contractual relationships to create intellectual structures. The structures allow control through norms in the contract specifying the relationships between actors, defining what usage is prohibited as well as defining what asset the property right refers to. It is important to consider what type of control is needed for the specific asset before drafting an agreement. For example, a license agreement can create an obligation for the licensor to transfer the technology and instruct relevant persons about its usage. But, it can also entail an obligation for the licensor to refrain from taking legal action.

Technology licensing exposes the licensor since it creates a risk of the partners appropriating the technology or the knowledge related to the technology. A technology Licensing Agreement (TLA) is a contractual means to ensure control (Brosseau & Coeurderoy, 2005). The design of the contract, and hence the control, depends on the scope of transfer, the competition in the market, and the institutional and relational environment. There should be clauses relating to the scope of the license, the parties' respective obligations, enforcement of the contract as well supervision clauses e.g., on sales or industrial and R&D processes. In terms of the scope of the license, there can be exclusivity clauses relating to territory or a limited number of licensees. There can also be a transfer solely on the rights to use the technology or the inclusion of knowledge related to the use of technology. An important clause to pin-point is clauses relating to the commitment of property rights, which can affect the control that the TSA provides.

- A certification that the licensor is the actual and sole owner of the assets both technology and knowledge
- Guarantees that there are no claims from third parties opposing the IPRs
- A commitment by the licensor to defend the license from potential claims.

These contracts are thereby needed for control if the target firm is licensing its internally developed technology (licensor), outsourcing parts of the technology to another actor (licensee), or if the acquiring firm is planning to license the technology after the acquisition is finalized.

Relational assets are also protected through contracts. Provider agreements are other important contracts for controlling the technology if the technology is wholly or partly outsourced by the target firm and the target firms' preexisting providers (Braggs, 2006).

The rights and obligations provided through contractual regulations is however limited in the sense that it only applies to the parties. Hence, if a third party infringes on the right, this cannot be enforced. This differs from intellectual property rights that can be enforced against any party infringing on the right that the right holder possesses.

#### **2.4.1.3 Technical Control**

Technology-based forms of control are primarily of practical character and are typically enforced by controlling a specific asset technically (Petrusson, 2004). Information technology, particularly databases and software solutions, plays a crucial role in establishing control for intellectual assets. This is explained by Petrusson (2004) as a medium that creates new dimensions in accessibility and establishes platforms for constructing a business. Overall, technical control in this context is related to the use of technology for establishing structures, platforms, and other solutions that enable control of intellectual assets.

#### **2.4.1.4 Secrecy**

Protecting knowledge assets solely through intellectual property rights has been regarded as inadequate protection. This is especially true for patent protection since knowledge related to R&D often falls outside of the scope of protection of the invention itself. Trade Secret protection expands the protection since it can include this type of knowledge. Furthermore, unlike many intellectual property rights, there is no time limitation. Thereby, the protection remains until the information is disclosed. However, trade secret lacks the exclusivity granted by patent protection. If other actors create the same information themselves, this falls outside the scope of protection (Niebel et. al,

2018). Petrusson (2004) holds that clauses regulating secrecy in contracts, regulations, and policies allow claiming knowledge as trade secrets. Hence, trade secret management can be used by the firm as a tool to protect sensitive information.

Trade secret claims based on contractual regulations arise when there is a clause stipulating that certain information should be regarded as a trade secret or should be kept as confidential information, for example, it can be related to technical documentation, customer information, or specific knowledge.

Policy-based claims can be made if there is a corporate secrecy policy (Petrusson, 2004). Policies can be in the form of clear protocols or guidelines for the employees on how to handle gained or restricted confidential information (Niebel et. al, 2018).

Regulation-based secrecy can be found in national law but also in supranational law. The Trade Secret Directive article stipulated that information can be qualified as a trade secret if the following provisions apply (1) it is not a part of the body, a precise configuration or assembly of the components nor generally known or readily accessible to persons in the circle that normally uses the information (2) has commercial value due to it being secret (3) reasonable steps have been taken to keep the information secret by the person who is lawfully in control of the information.

This formulation allows for business information, know-how, and technical information to be protected as trade secrets. However, an important distinction for know-how is that all normal skills and capabilities a person possesses through their employment are not qualified as trade secrets (Recital 14 Trade Secret Act).

The term commercial value refers both to the current commercial value of the information but also to the potential commercial value that the information could have. What determines the commercial value is the harm that would arise for the firm holding the information if it was disclosed (Article 2.1, Recital 14 Trade Secret Act).

There is no legal definition regarding what specific reasonable steps should be taken by the holder of trade secret, however, it could be though regulating contractually that the information should not be disclosed, physical or technological measures such as

controlling access through locked doors or password-protected databases or organizational measures such as firm policy (Niebel et. al, 2018). The trade secret directive does not grant a right connected to the trade secret, instead, it sanctions the unlawful access to information that qualifies as trade secrets (Article 4 Trade Secret Directive). The holder of a trade secret can thereby mainly attain compensation for the unlawful use.

#### **2.4.1.5 Market Power**

Market power is a means for companies to claim property in the business arena, however, no legal action can be presumed if there is a breach (Petrusson, 2004). Intangible assets can also be a source of market power in the sense that valuable knowledge assets can be translated into market power (Jaax & Miroudot, 2021).

The degree of control possible through market power depends on how a firm succeeds in transferring a sustained competitive advantage to advantageable market conditions. If this is successful a firm can attain control over other actors in the value chain, hence having control through market power (Shilling, 2012). For example, a large installed base of customers of a target firm means that the target firm has data on what the customer needs are in relation to products or services which can be beneficial for R&D measures. Furthermore, in an acquisition setting the market power of the target firm is important to evaluate the market control to ensure the acquiring firm reaches an intended market or to extend the sellers existing market power (Inderst & Montez, 2019). The market power of the target firm is also important to analyze from an anti-trust point of view.

First-mover advantage can also result in market power (Shilling, 2012). For high-tech products, this is particularly important due to these products rarely being commodities as well in many cases being significantly differentiated due to differences in technology (Pleatsikas & Teece, 2001).

Mutual dependency is another form of market power, which can be applied both to suppliers and buyers of the target firm. A mutual dependency exists if the supplier and target firm or customer and target firm are dependent on each other's products or services. If the supplier of the target firm mainly sells technology components to the

target firm, they are a larger buyer. If the technology component in question is only supplied by a few suppliers, the target firm is dependent on the supplier to create the technology. This means there is a mutual dependency between the actors. A larger buyer will increase the mutual dependency since it means that they are increasingly dependent on the target firm. This mutual dependency is further strengthened if there is a need for large-scale switching costs (Pleatsikas & Teece, 2001).

## **3 Method**

This section presents the method used in the research study. Initially, the research strategy will be outlined, followed by the considerations made for the research design. Furthermore, the research method of the conducted research will be described, followed by a discussion on the research quality of the conducted research study.

### **3.1 Research Strategy**

The research strategy of a study is the overall approach taken in the conducted research. The research strategy sets the relationships between the theory and the research, the ontological and epistemological positioning and if the study conducted is qualitative or quantitative (Bryman & Bell, 2019). This section presents the research strategy used in the study.

#### **3.1.1 Relationship between theory & research**

The research has used a deductive approach mainly, by testing pre-existing theory (Bryman & Bell, 2019). As mentioned, however, there is a complementary inductive approach in the parts where there is no theory available, in this part, the research has aimed to generate theory through interview studies, thereby inductively generating theory through empirical observations (Bryman & Bell, 2019). Thereby, the overarching approach has been abductive.

The main theories used are the pre-existing theory of managing intellectual property in an M&A process and the theory of intellectual assets management in a university setting. The part where there is no theory is mainly related to the handling of human- and relational capital and its related control positions specifically in intangible-intensive target firms. Furthermore, as mentioned, there is a pre-existing theory on the identification and evaluation of intellectual assets in a university setting, however, there is no theory of the identification and evaluation of intellectual assets in the initial stages of an M&A. Thereby, in addition to the deductive approach the study also has an inductive approach in this aspect. Furthermore, there is no pre-existing theory related to risks specifically connected to intellectual capital in relation to the intended use of the intellectual assets, in this part, the approach has also been inductive.

### Main interviews

In the main interviews, the *pre-existing theory* was tested through interview questions. By gathering the data in the findings, a *revised theory* was created. The respondents in the main interview were the same respondents of the pre-interviews based on knowledge of the cases of the sample and knowledge of how intellectual assets were handled in acquisitions.

### Hypothesis interviews

Based on the *revised theory*, hypothesis interviews were conducted where the revised theory was pressure tested through additional questions and a visualization of the *revised theory*. Based on the gathered data from these interviews, the findings were used to adapt the *revised theory*. The end product of the adaption is the *final theory*.

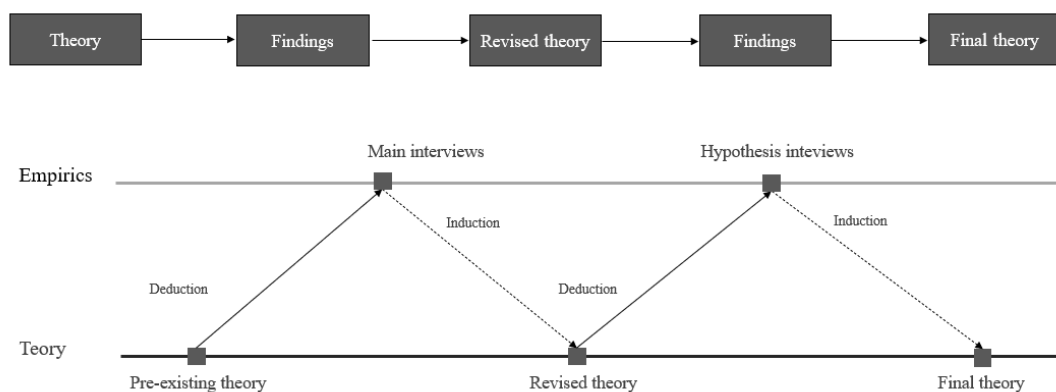


Figure 11: Visualization of the deductive and inductive approach used in the research

### 3.1.2 Ontological & epistemological placing

To understand the object of the research, the research questions have been placed ontologically and epistemologically. The primary ontological question is if the object being observed exists objectively, regardless of human interaction, or if the object is made real through human activity. The primary epistemological question is instead focused on how knowledge can be gained of the object being observed. The ontological positioning, what the object being researched is, determines the epistemological position, and how the knowledge will be gained of the object being researched. Thereby, the ontological positioning determines the appropriate epistemological positioning (Bryman & Bell, 2019).

The research study focuses on firms, intellectual assets, human capital, relational capital as well as risks and control positions related to intellectual assets. Hence the key objects being studied are concepts created by humans, thereby a social phenomenon constantly in flux (Bryman & Bell, 2019). The objects being studied are thereby ontologically subjective, positioned in ontological constructionism. To observe these objects of social sciences, which are part of the social world, a natural scientific approach is not sufficient. The study is instead epistemologically positioned in interpretivism where the participants' views in relation to the studied object are in focus, which is different from the natural science approach. Due to the ontological subjective, an epistemological interpretivism positioning is appropriate. The interpretive approach allows for understanding behavior, and why and how a social action is performed. Furthermore, interpretivism is also concerned with the process of these social actions (Bryman & Bell, 2019). This means that the implications of the firm-based handling of intellectual assets in an acquisition can be understood.

Conclusively, the aim of the study is not to explain the nature of intellectual capital, but instead to understand how intellectual capital impacts an acquisition, or rather how the handling of intellectual capital in an acquisition impacts the outcome of said acquisition.

### **3.1.3 Qualitative research**

As explained in 2.2.2 the aim of the study is to understand how intellectual assets as a socially constructed phenomenon, are considered by the acquiring firm during the acquisition process, hence a particular situation. Due to the aim being of understanding the object as well as how the object was handled, it is appropriate to use a qualitative research strategy (Bryman & Bell).

The acquisition process is highly confidential. It was thereby necessary to gain the trust of the respondents. Bryman & Bell (2019) regard surveys as an insufficient method to gain such trust. Instead, it is appropriate to use a qualitative method in order to gain the trust necessary. Generally, qualitative research is generally associated with generating theory. In this study, the theory was generated in some parts, but the main part was testing theory. Bryman & Bell (2019) argue that even if qualitative research generally is used to generate theory, it can also be used to test the theory. Due to the interpretive

positioning, it is also appropriate to use a qualitative method to understand the socially constructed object and the social world. Hence, intellectual assets in an acquiring firm's acquisition process.

Due to the considerations mentioned above, a qualitative research strategy was deemed to be an appropriate method to use in the study.

## **3.2 Research Design**

The research design is a framework that is used in the research both to collect and to analyze data that is suitable for the research questions (Bryman & Bell, 2011). The research design chosen for the study is a comparative multiple case study, where the same method was applied to a study of multiple acquisitions of intangible-intensive firms. These acquisitions will hereafter be referred to as cases.

The comparative design was used since it allows for a better understanding of a social phenomenon when compared to different cases (Bryman & Bell, 2019). The comparative method was used to pick the sample size, where the aim was to pick multiple cases with the same motive. However, some cases that are part of the sample cut across due to the limitations of acquisition that were intellectual capital intensive within the firm. The case study design was used since it allows the observer to see the complexity and nature of the cases in the sample (Bryman & Bell, 2019).

The case study was used to understand what types of intangible assets there were key assets of the acquisition and to understand both the role of human capital and relational capital were in relation to the key assets and to the technology. Hence, the multiple case design allows for the phenomenon to be better understood, while also understanding the complexity and the nature of each case.

In practice, this meant collecting data on how the intellectual capital sub-groups were handled in the cases, the identified risks and control positions in each of the cases, then comparing the data of the cases to identify similarities and differences and clustering the data based on similarities and differences as well as the sub-category of intellectual capital.

## **3.3 Research Method**

The research method is the technique used when collecting data (Bryman & Bell, 2019). This section presents the research methods used in the study.

### **3.3.1 Required Data for Research Study**

To answer the main research question regarding how intellectual capital management can impact the outcome of an acquisition of an intangible intensive firm, data was gathered in relation to the sub-research questions.

Sub-research question 1 regards the strategic reasoning behind an acquisition of an intangible-intensive firm. It was thereby important to gather data on the motives and strategy of an acquisition from the buyers' perspective, which was done through theory, as outlined in chapter 2.2.1, and through posing questions of the strategy in the interviews.

Sub-research question 2 regards the risk associated with acquisitions of intellectual capital and its effect on the success of the acquisition. Firstly, intellectual capital as a concept needed to be understood which was achieved through theory as outlined in chapter 2.3.2. To understand factors affecting the success of an acquisition, the theory was used as outlined in chapter 2.2.4, furthermore, the case study was used. In relation to risks, the primary data was gathered through the interview study including the case study, and theory relating to value creation and control over intellectual capital which is outlined in chapters 2.2.1 and 2.4.

Sub-research question 3 regards how intellectual capital can be managed in the acquisition process before closing the acquisition. To answer this question there was a need to understand both what activities needed to be conducted in relation to the intellectual capital to manage it as well as the phases of an acquisition process and the legal framework in order to decide where in the process these activities could take place. In regard to the management of intellectual capital ICM theory was used as outlined in chapter 2.3, and theory in relation to the phases and legal activities are outlined in chapter 2.2.3. Furthermore, data were also gathered in the interview and case study.

### **Sub-research question 3**

*How can intellectual capital be identified and evaluated before an acquisition?*

The third sub-research question aims at understanding how intellectual capital in an acquisition context can be better understood and what can be done, and when, to mitigate and raise awareness of the risks.

#### **3.3.2 Data collection**

##### *Literature study*

The first data collection was done through a literature study of M&A literature, management literature, and intellectual capital management literature, to identify relevant theories to the scope of the study. This was done to identify how to break down intellectual capital into sub-categories and categorize human capital and relational capital as well as control positions related to intellectual capital to attain an understanding of the object of the study. Furthermore, the structure governing the relevant structures which need to be considered were identified, which were the phases of an acquisition and legal contracts governing the phases. Finally, data were gathered on intellectual capital management in an M&A process. The data was used to identify how intellectual capital can and should be governed to create value for the firm that possesses it and for an acquiring firm in an acquisition. Online databases were used to access and assess relevant publications within these fields. Primarily Gothenburg- and the Chalmers University of Technology databases and Google Scholar. The theories found in the literature study were later tested in the main interviews.

##### *Pre-interviews*

Pre-interviews were held at the industrial firm undergoing digital transformation. The pre-interviews were initiated with a description of the study, followed by a description of the respondent's role in the firm and involvement in the acquisition process. Then, a semi-structured interview was held where the questions were posed to grasp the interviewees' knowledge of the categories of intellectual capital, and involvement of intellectual capital in an acquisition process. This part was used to evaluate the competence of the respondents to provide valuable insights in relation to the research questions. Furthermore, the respondents were asked to provide specific cases where the

target firm was intangible asset-intensive and to provide a short explanation of these acquisitions and their involvement in the cases. This part was used to assess what cases should be part of the sample, as well as the respondent's ability to provide valuable insights into the cases.

### *Interviews*

The respondents consisted both of M&A directors, Business development & strategy advisors, IP directors and Lawyers directly involved with acquisitions, within an industrial firm undergoing digital transformation. Furthermore, one interview was conducted with a director of Strategy and Transactions at one of the Big Four consulting firms. This interview specifically targeted Software evaluations within acquisitions.

The interviews conducted were semi-structured, where the questions were predetermined but allowed for a modification of the questions and follow-up questions during the interview. Semi-structured interviews allowed for showing visualizations of the intellectual capital subcategories as well as allowing the respondent to answer freely to the questions posed. This is an appropriate method to use in a qualitative study since it allows the respondent to explain the complex nature of the studied object without limitations (Bryman & Bell, 2019). The predetermined questions we split up based on the intellectual capital subcategory; technology, human capital, and relational capital, in order to study how they were each handled in the acquisition process by the target firm. The follow-up questions depended on the specifics of the case and what the respondents' answers were to the predetermined questions.

### *Case sample*

The cases chosen were chosen based on the target firm being intangible-intensive, the motive of the acquisition, the key assets of the acquisition, and the maturity level of the technology acquired. The aim was to choose cases with the same motives, the same technology maturity, and the same key assets in accordance with the theory. Due to the limitations of acquisitions of the intangible-intensive target firms, some cases had different motives, maturity grades, and different key assets. However, there were multiple cases with the same motives, technology maturity, and key assets.

### *Main interviews*

The main interviews were conducted at the industrial firm undergoing digital transformation, as well as the consultancy firm. The purpose of the main interviews was to test the theory and apply the theory to the case sample when a deductive approach was used. When there was no pre-existing theory, the interviews were conducted to create a theory. Hence the main interviews were conducted to get data on what motive of the intangible-intensive acquisition was based on, how intellectual capital was identified and evaluated as well as overall handled in the sample cases, what risks were identified in relation to the intellectual capital as well as the control positions related to the intellectual capital. Another important data point is what conducted activities in the acquisitions that were successful and what activities that were less successful in relation to the outcome of the acquisition. This data gathering was done by posing semi-structured interview questions as well as follow-up questions to answers given.

### *Hypothesis interviews*

The hypothesis interviews were held at the industrial firm undergoing digital transformation. The final theory was illustrated and shown to the respondent. Questions related to the theory were posed, as well as general observations from the respondent. Hence the hypothesis interviews were also semi-structured. The purpose of these interviews was to test the revised theory, in order to validate it. Furthermore, another purpose was to allow feedback from the respondent to revise the theory if needed.

### *Document analysis*

Document analysis as a data collection method is utilized to attain a deeper knowledge of a qualitative research study (Bryman & Bell, 2019). Document analysis was conducted as a method for data collection when the identification and evaluation of intellectual capital and its related control positions in a specific case had been conducted in document form. This had been done in relation to some of the cases and consisted of documentation in PowerPoint form.

## **3.4 Research Quality**

### **3.4.1 Credibility**

Credibility refers to the trustworthiness of the results of the study (Bryman & Bell, 2019). The theories on intellectual capital were mainly sources that are at least 10 years old, thereby a possible validity issue is how relevant these are with the rapid development of technology. However, the literature used that was recently written as well as the analysis of recent acquisitions and validation of theories through interviews mitigated this risk. Another validity issue relates to the sample of cases used, since some cases cut across, meaning that the key assets and the motives behind the acquisitions were not the same. However, the samples were chosen carefully based on the cases available to analyze.

Furthermore, there is an additional validity issue related to some of the cases in the sample being recently closed, thereby the outcome of the case has not yet been established. However, this was mitigated by posing questions related to the risks that were identified by the acquiring firm and drawing conclusions on the impact these risks may have on the outcome. Thereby data was gathered on the activities conducted by the acquiring firm and possible outcomes based on that risk, not the outcome itself. Through this, the validity issues were mitigated.

Acquisition data is also of a sensitive nature for the acquiring firm, thereby some important information could have been left out. This was mitigated through the anonymization both of the names of the respondents as well as the cases and the exact technology of the target firm.

### **3.4.2 Transferability**

Transferability relates to if findings can be transferred and applied to a different context or if the results are specific to the scope of the study (Bryman & Bell, 2019). The study was conducted for specific acquisitions at an industrial firm undergoing digital transformation. Another acquiring firm would have different acquisitions and could have considered intellectual assets differently in the acquisition process. Thereby, the transferability is low in that sense. However, the final theory is of intellectual capital-related activities that any firm can conduct. The activities are related to M&A phases

and legal contracts that are generally used. Thereby, the final theory could be transferred to another type of firm that acquires the same type of intellectual capital.

### **3.4.3 Dependability**

Dependability refers to the possibility of repeating the findings of the research if the research were to be repeated at a different time (Bryman & Bell, 2019). If the same methods were used, the same respondents were interviewed and the same cases were analyzed, the same findings would be found. However, the study is based on acquisition data which is confidential. Furthermore, some of the chosen cases are an acquisition that has been closed within a year or two years prior to the study. This means that the outcome of the acquisition may change if issues arise, which means data related to the success of the acquisition may differ. This was mitigated, by choosing as many cases as possible where over two years had passed since the closing of the acquisition. However, due to the limitations of acquisitions of intangible-intensive firms, some cases were closed within two years of the study being conducted. It was also mitigated by focusing the interview questions on the risks identified during the acquisition process, and if these risks could be an issue of the outcome or not. Thereby, the actual outcome has less of an impact on the data gathered.

### **3.4.4 Confirmability**

Confirmability refers to the conduction of the study, and if this has been made objectively in good faith or not (Bryman & Bell, 2019). The possibility of bias in the study has been minimized by the selection of respondents for the study, where the roles of the respondents varied, furthermore, more than one in each role was interviewed. However, the respondents were from the same industrial firm undergoing digital transformation, this was partly mitigated by including one respondent from one of the Big Four consultancy firms. However, to make the research more objective, additional firms could have been included in the research. However, due to the limited amount of time, including respondents of multiple roles, and multiple respondents in the same role as well as one external respondent were deemed sufficient to mitigate the objectiveness of the study.

## 4 Findings

In this section, the results based on the data collection interviews and document analysis are presented. The section is divided into four subheadings. In 4.1 data relating to the strategy behind the acquisition is presented. In 4.2 data related to the risks related to the assets are presented. In 4.3 findings related to the control of intellectual assets are presented. In 4. 4 findings related to the identification and evaluation of intellectual capital are presented.

### 4.1 The strategy behind acquisitions

For the cases reviewed in this thesis, several motives have been communicated as the reason for acquiring the different target firms and multiple motives can be found for one acquisition. Some descriptions of the motives have been changed from theory, and some motives have been added after the conducted interviews. Although previous research gives a good overview of firms' motives behind acquisitions, the motives found for these specific cases more thoroughly pinpoint *what* the acquirer was after and give a better indication of *how* the different key resources play a part in the acquisition. In some cases, specific motives have been more important, but the common factor amongst the cases is that they all have had more than one motive driving the acquisition. The key resources have been equally communicated during the interviews as drivers for the acquisitions, where they wanted intellectual capital to have been directly linked to the reason behind why they went for this specific target. Looking at Table 1, all cases analyzed have involved some type of technology desired by the acquirer, both hardware and software-related solutions, some more important in one case than others. The noticeable difference between the cases has been seen in the other types of intellectual capital where knowledge and relationships have been related to the technologies and motives in various ways.

Case D had important supplier relationships for technologies they wanted for future development. But this was not the key asset for the acquisition since they wanted to start to produce this themselves.

Table 2: Acquisition motives and Key Intellectual Capital

Motives	Case A	Case B	Case C	Case D	Case E	Case F	Case G
<i>Financially profitable</i>	<b>X</b>				<b>X</b>	<b>X</b>	
<i>New geographical markets</i>	<b>X</b>		<b>X</b>				
<i>New customer base</i>		<b>X</b>		<b>X</b>	<b>X</b>		
<i>Fear of loss of market share</i>						<b>X</b>	<b>X</b>
<i>Synergies</i>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<i>New technology / Portfolio diversification</i>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Key intellectual capital</b>	Case A	Case B	Case C	Case D	Case E	Case F	Case G
<i>Specific product-related technology</i>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<i>Technology-related know-how</i>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>		
<i>Innovation &amp; R&amp;D capabilities</i>	<b>X</b>		<b>X</b>				
<i>Customer relationships</i>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	
<i>Supplier relationships</i>				<b>X*</b>	<b>X</b>		
<i>Management capabilities</i>						<b>X</b>	

\*The dependency on a supplier is high, but the supplier's pre-transaction was not compliant to the acquiring firms' internal guidelines and where thereby not a motivation for the acquisition

## 4.2 Risks related to the acquired assets

The cases which got an X in one specific intellectual capital risk were deemed to have this specific risk in relation to either or a combination of the technology, human capital, or relational capital that they were acquiring (see figure X). The cases without an X for a specific risk do not mean that the acquirer has seen past that risk or that the risk did not appear at all. The intellectual capital risks that Table 2 contains are not exclusive to all intellectual capital risks that can be related to technology, human, or relational capital. However, it does show that all mentioned risks in Table 2 can be important to take into consideration when acquiring a firm of the character investigated in this study, even if a risk has only been mentioned in relation to one of the cases. A risk connected to a specific case does not include a specific outcome in connection to the risk post-acquisition or any specific action taken to mitigate the risk was made. Only the risk was specifically highlighted either in the pre-transaction evaluation or the due diligence.

Table 3: Mentioned risks associated with acquiring intellectual capital in each separate case

Intellectual capital risk	Case A	Case B	Case C	Case D	Case E	Case F	Case G
Lack of IP rights	<b>X</b>				<b>X</b>	<b>X</b>	<b>X</b>
Relational-specific dependency					<b>X</b>	<b>X</b>	
Losing key people	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Lack of technology-related know-how	<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>
Lack of new market control	<b>X</b>						
Lack of contractual control					<b>X</b>		
Ownership of the technology		<b>X</b>		<b>X</b>	<b>X</b>		
IP competition & Litigation		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>
Lack of future protection for innovation efforts			<b>X</b>		<b>X</b>		

### *Lack of IP rights*

Lack of IP rights has been mentioned as a risk by multiple interviewees. It refers to a lack of intellectual property protection of the technology in the target firm, which is important for the acquiring firm to secure control over the intellectual capital. Intellectual property is mainly related to specific product-related technology, hence the findings in this part relate to technology.

One interviewee mentioned this in relation to a target firm in relation to the suppliers that the target firm had pre-acquisition. *“The target firm did not have an appropriate agreement with any of their suppliers related to their IP. We had to put those sorts of agreements in place, to ensure that there was legal protection of the technology.”* Furthermore, an interviewee stated that a lack of IP rights is common when the target firm is smaller; *“A lack of IP protection is common when we do these types of acquisitions. It is normal that the target firm does not have agreements with suppliers*

*or customer or their employees”*. Further emphasis was put on the acquiring company taking measures during the acquisition process to ensure there is sufficient IP protection of new technology that the in the R&D stage at the target firm *“The target firm was already working on new projects, which we now after closing understand needs to be adequately protected.”*

One interviewee compared the lack of IP rights, with contractual control of IP. Were the lack of IP protection is a risk, but not the contractual control; *“We were struck by the fact that they did not have a patent portfolio. The lack of a patent portfolio was a bit of a concern since the technology clearly could have been patented. However, they were good at protecting their IP in the agreements they have made with other actors.”*

Furthermore, in Case G, the acquisition was based on acquiring a product-specific technology. However, the target firm had applied for a patent which was not yet granted. One interviewee mentioned that the lack of IP rights was particularly concerning in this case; *“There had been a value accounted for the scope of the patent claims in the patent application. When the scope is cut, the value is lost. After the acquisition, they found out the patent had been granted with such narrow claims that the value was close to zero. Anyone could engineer around the granted patent.”* This shows the importance of intellectual property for the acquiring firm to have the necessary control of the technology to create value.

Conclusively, to be able to create value from the acquired technology, intellectual property protection.

#### *Losing key people*

When asking about the importance of key people in the target firm, or when the key people were mentioned specifically by the interviewees, the overall response has been that it is vital to retain key people.

One interviewee specifically spoke about the risk when losing key people, and elaborated on how the risk takes form. *“It is more of a short-term issue. Harder to assess the long-term impacts. Whether there would have been a long term I do not know. Short-term it would be harder to manage, and it would have probably impacted*

*more. They had the in-house ability, so they would have mitigated the long-term effect, but the short-term is worse. It is all about the engineers.” “More about the suppliers, if they cannot deliver, they had the knowledge to create something themselves. This could have had long-term effects if they were not solving this, but the historical tribal knowledge helped them.”*

For an acquisition that targeted a technology of a low maturity grade, retaining key people was also of importance. The interviewee mentioned that they “...kept one employee [the inventor], the technology was only partially developed, so it needs to be fully developed to bring it (the product) to market. There were risks regarding the development of the technology due to the in-house competence of this specific product.”

Keeping people was not only connected to the acquired technology but also to access human capital and relational capital. This was particularly emphasized when the R&D of the target firm was outsourced. For instance, one interviewee specifically mentioned that “knowledge assets were the main asset they were after when they bought firm E. There was knowledge both of how to handle the manufacturers and how to draft the specifications for the hardware components. Firm E was also good at handling customer relationships.”. Thereby they accessed both relational capitals in the form of customer relationships of the target firm and human capital in the form of know-how and competencies regarding ordering and assembling technology.

Another interviewee stated the following “There were partially coders that were important, but mostly they put the pieces together. It was an off-the-shelf solution. They needed to improve by looking at what open-source code was used. Like in all acquisitions, most of the time they are looking at all domains, operations, engineering, software, sales, etc. and they look at which people to keep. If there are patents, they look at key inventors, but here they did not have a patent.”

When the internal capabilities of the acquiring firm do not match the target firm, there is a higher risk if key people were to be lost. This was specified by an interviewee “There is often knowledge that they want to capture after an acquisition since the people that come with the acquisition often possess knowledge outside the internal capabilities, which the acquirer is very interested in.” Another interviewee mentioned

that “*key employees are important since it is a new area for the firm.*” Furthermore, the interviewee compared the knowledge of the target firms’ employees to the knowledge of the acquiring firms’ employees. “*The knowledge is about software and hardware; they don’t have that competence internally in the firm otherwise. If they [key people] leave, they will have to get outside competencies.*”

#### *IP competition and litigation*

Competitors can be either direct competitors or IP competitors. IP competitors are actors that have IP protection in the same technology area as the target firm but are not direct competitors in relation to the product offering. For example, Google or Microsoft can be IP competitors for traditional industry companies within certain technology areas even if their product offering vastly differs, due to global digitalization.

IP litigation has been mentioned as a risk by multiple interviewees. One interviewee mentioned that they evaluate IP competitors in the M&A process: “*There are some big players with IP in this area, which brings nervousness. We look at it pre-acquisition, and some NPEs:s have been a problem, not a lot, but there have been some issues.*”

Another interviewee held that the amount of risk that the IP competition poses, varies depending on what types of companies the IP competitors are. “*The risk becomes bigger when the IP competitors are very big players which the acquirer then has to compete with. The target firm has not been sued yet, but the risk is that when a larger firm acquires them, then the other IP competitors will jump on you. You need to map the IP competitors and make an external analysis based on this early in the initial phases to identify the risks.*”

Another interviewee mentioned IP competitors with an aggressive IP strategy as a particular risk since it also increases the risk of litigation after the acquisition. “*There were a few big players which were suing one another. One point was to know how to position themselves. There was no need to make noise, but we could be one of the next targets if they are aggressive.*”

Litigation activity was another frequently mentioned risk by interviewees. Specifically when the acquiring firm is a larger actor in comparison to the target firm. One specific interviewee mentioned that the target firm has a higher litigation risk after the acquisition. *“We have a bigger target on ourselves, and when the deal is closed people jump on their back since we are strong. So, there were of course concerns. In some areas, we have a very good IP portfolio, but in other areas, they might not be able to fight the same since they do not have good IP portfolios.”* Another interviewee specifically mentioned IP activity as a mitigator for litigation risk *“There is a risk in not doing the IP activities: landscaping & product clearance. When we buy a firm like Case E and put it into our portfolio as a multi-billion-dollar business, they become attractive for litigation. As soon as they become part of our business they become targets because then there is a lot more money behind it. In another acquisition we made there was no product clearance, and they (the target firm) are facing litigation and injunction in one of the key markets, they might not have found this before even if they have done it (the IP activities), but it sets them up for failure when they don’t do it at all. Being invested early sets you up for success down the road, and when you know about the risk you don’t have to react and respond when the market comes after you.”*

Furthermore, NPE:s or the prerogative term “patent trolls”, have been mentioned as a concern regarding litigation activity. An interviewee mentioned that *“They (the target firm) become a target from trolls when they are acquired by us, so a clearance would be very good. They check if the target firms are in the striking zone of litigation activities.”*

An interviewee mentioned a lack of protection from litigation as a risk after the acquisition, specifically related to Case D *“Because they don’t have good protection from litigation, they have been sued two times by NPEs and they are targets. They need to reconsider the provider agreement and put in a clause to protect from IP litigation. This provider needs to be changed, and an indemnification clause is necessary to include to provide real litigation protection.”*

#### *Ownership of technology*

Regarding ownership of the technologies acquired, the risks have been mentioned in relation to when the acquired firm has had issues with third-party ownership. It has

been mentioned during the interviews that the more when smaller technology companies are acquired, it is often noticeable clauses with bigger tech firms whose got some type of claim on the technologies. These clauses have been seen as potentially very problematic from an IP perspective and give incentives to make sure that the technology can be used without the third parties putting any claims on anything or having reasons to use them.

One interviewee especially highlighted this risk and what implications it might have: *“From a legal point-of-view it is important to understand if they have ownership of the assets that they claim they have ownership to. Have they created the code internally or licensed it from somebody else? If they own the assets, the protection is then important to evaluate. Do they have the protection of the assets? How and in what way have they protected the asset? If a competitive advantage has been presumed, based on proprietary code, and the evaluation shows that the code is created by a third party and licensed by the firm, this competitive advantage can be lost. What is important to consider is that there may be an exact replica of the technical solution by other actors, which means there is no exclusivity gained through acquiring the target firm.”*

#### *Lack of technology-related know-how*

Technology-related know-how refers to the knowledge of the target firm’s employees or management that is specifically related to the technology in a technology field that is new to the acquiring firm but that the target firm possesses, and that can be vital for the utilization of the technology. It does not have to be connected to internally developed products, but it can be related to assembling of or specifications for outsourced technology. One interviewee specifically mentioned that there were risks connected to a lack of technology-related know-how in the acquiring firm; *“there were risks regarding the development of the technology and the in-house competence of this specific product”*, meaning in this specific case that for the acquirer to be able to utilize the acquired technology, there was the development of the product needed that acquired specific knowledge to perform. In another case, it was mentioned that *“the knowledge acquired was about the software and hardware. If the people leave, they will have to get outside competencies”*, specifically stating that the technology-related know-how was needed to utilize the acquired technologies. Regarding outsourced technologies, it was mentioned that *“the knowledge that firm E has been about the outsourced*

*technologies. They have the technical knowledge to create specifications for the producer of the product and knowledge of how to use the software. They have high technical know-how, even if the R&D is outsourced in the form of handling the producers. This competence we do not have in the acquiring firm.”*

Another interviewee stated the difficulty in capturing technology-related know-how; *“For M&A it’s easy to get the patent portfolio, but what is behind the scenes, what has not been captured in patent, what are the landmines, what people are really working on?”* This statement also shows that the acquiring firm is after technology-related know-how as well as the technology itself. The interviewee followed up by connecting the technology-related know-how to its dependency on people *“If they lose the people, they lose all the know-how to the technology. The number one is to keep the people.* *“This answer also shows the intercommunion between people and technology-related know-how, where the technology-related know-how is lost if the person possessing it leaves.*

A lack of technology-related know-how was not only connected to the risk of not being able to utilize the acquired technology but also not being able to develop the technologies further without the people with the know-how. In one case it was specifically mentioned that *“We have been able to learn from them about this technology to move around in that area and can now further develop new products within this area which they would not have done otherwise “.*

#### *Lack of future protection of innovation efforts*

The risk regarding a lack of future protection of the target firm’s innovation efforts was mentioned as a risk in relation to where you want to take the firm after the acquisition as well as capturing the full value of what you are buying. In relation to the cases, it was stated that 1) *“the target firm was very sophisticated with handling their portfolio and were very aggressive and assertive in the history. The concern was more related to that they had done so much protection previously they were not really focusing on protecting the recent innovations”. 2) “The due diligence phase is a great opportunity to which products they are working on that they are planning to release so that they can prepare themselves and know which people to contact. If the target firm releases a new product before this happens, then the opportunities for good IP protection could*

be gone”. 3) “Now that we have acquired this firm, we are putting certain mechanisms into place to ensure there is enough protection of technology in the new projects they are working on “. All three cases point towards that there were risks in relation to that the technologies having insufficient protection and that there were possibilities of losing that value if not handled.

#### *Relationship-specific dependency*

Relationship-specific dependency came up as a specific risk in two of the cases. What is meant by this risk is that the acquiring firm is acquiring customer and/or supplier relationships as intellectual capital. Therefore, there is a big risk in that the value of the acquisition is lost if the relationships fail. One interviewee stated that in one of the cases, there were concerns about a large chunk of the revenues coming from the same customer which was needed to be raised as a risk. In another case, it was stated that:

*“There were important relational assets that motivated the acquisition, both on the customer and the supplier side. The technology was fully outsourced both on the hardware and software side and they had a model for production both on the engineering and the production side.”* This was a new type of business model that the acquiring firm has not had before, and although the acquired firm had strong connections to their customers and suppliers, there was a risk in that the business was driven as relational.

#### *Lack of contractual control*

In connection to the risk of a relationship-specific dependency, the risk around a lack of contractual control was mentioned. As mentioned by one interviewee *“A worry with the acquisition was that they had very few written contracts overall, the business was driven as relational”*. This risk was connected both to the customer and the suppliers and regarded as a continuation of the relationships and the intellectual property rights concerning the technologies to ensure protection.

#### *Lack of new market control*

The risk of lacking control of new markets were specifically related to one of the cases studied. Although this risk could be considered and brought up as a risk in all the cases where new geographical markets were a motive, it was only specifically mentioned in one. As stated by the interviewee, *“You want to scale a firm and take it to new markets,*

which is technically not a problem, but the protection of the technology, brand, relations, and other contracts is only on a local level, which becomes a big risk in terms of intellectual property”. Furthermore, as IP competitors often are very big players, the acquirer then must compete with them as well.

### 4.3 Controlling intellectual capital

Intellectual capital can be controlled either through intellectual property rights (right-based property), contracts (contract-based property), technical control, secrecy, or market power (Petrusson, 2004). The respondents have mentioned several control positions in relation to key assets of an acquisition. The control positions mentioned in the key assets have been mapped in Table 3.

Table 4: Control mechanisms for acquired intellectual capital

Key intellectual capital	Specific product-related technology	Technology-related know-how	Innovation & R&D capabilities	Customer relationships	Supplier relationships	Management capabilities
Right-based property	<b>X</b>					
Contract-based property	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Technical control	<b>X</b>		<b>X</b>			
Secrecy	<b>X</b>	<b>X</b>				
Market power	<b>X</b>			<b>X</b>	<b>X</b>	

Depending on which type of key assets there were in the acquisition, different types of control positions were mentioned by the interviewees. One interviewee mentioned that they want to identify what type of control position the target firm has and confirm that it is the same control position that has been stated by the target firm in the phases before

the due diligence process.” *From a legal point-of-view, it is important to understand if they have ownership of the assets that they claim they have ownership of. For example, if they have created the code internally or if they have licensed it from somebody else.*” If it is the latter, then they do not have ownership rights of the asset. Instead, the target firm has a usage right based on the scope of the license agreement. If they own the assets, it is then important to evaluate if the target firm possesses the ownership rights, or if it is an inventor in the target firm or another third party that possesses the ownership rights to the asset. What the acquiring firm needs to determine is if the asset is protected through a control mechanism and in what form this protection is.

*“If a competitive advantage has been presumed, based on proprietary code, and the evaluation shows that the code is created by a third party and licensed by the firm, this competitive advantage can be lost. What is important to consider is that there may be an exact replica of the technical solution by other actors, which means there is no exclusivity gained through acquiring the target firm.”*

### *Technology*

Right-based control has been found to have a varying matter of effectiveness as a control position for specific product-related technology. If there was a hardware component that was an important object of the acquisition, patents relating to the solution were seen as an important form of control if the scope of protection was broad to allow protection for the adaptations of the technology by the acquiring firm. However, if the software was the main object of the transaction, then patents naturally were not seen as an important control mechanism, unless it was U.S patents protecting the software. For acquisitions where software was the primary object of the acquisition, some respondents saw copyright to the code as an important form of control. However, emphasis was put on the use of open-source code, and the difficulty in controlling this type of code. The lowest form of control arises when the open-source code license is copy-left with a share-and-share-alike requirement which obligates the user to share modifications or new codes with the same license. This emphasis hence is on contractual control, and to what degree of control the target firm has based on the scope of the right in the contract.

A lack of control position or a slim scope of protection affects the sustainable competitive advantage since it allows competitors to have similar technology to the target firm. Hence, if the motive of the acquisition was product-related technology or market shares, one respondent mentioned that “*there should be an increased emphasis on evaluating the target firms’ control positions to the related assets in the initial phases of an M&A.*” This becomes particularly important when the motive of an acquisition is a new geographical market where the target firm does not have patent protection relating to the software or hardware.

### *Human capital*

In terms of human capital, multiple pre-study respondents held that the employees either added value to the technology acquired or the knowledge of the employees in the target firm was part of the motive for the acquisition. A common theme was the difficulty to control employees through contractual-based control since they can terminate their employment according to their contract. However, one respondent had previous acquisitions where the acquisition was made dependent on part of the purchase price being allocated to specified employees in the firm, to try to ensure they remained in the target firm after closing. Another form of contractual control that was mentioned by a majority of respondents to ensure that the human capital of management remained in the firm in the first years after closing was an earnout clause of a specific amount in the SPA. The amount in the SPA was further specified to if the target firm achieves set goals after a set time period. This means the management of the firm remains, thereby also keeping the tacit knowledge of the management team. In conclusion, through contractual-based control, the management team can be kept within the firm, and incentives for employees can be arranged. In addition to contractual control, technical control of human capital was also mentioned. IT systems, shared platforms, etc. was mentioned as tools to use to try and capture the knowledge within the firm.

### *Relational capital*

In the pre-study phase of the interviews, there were cases identified that had had challenges related to relational assets in the acquisition, that can be linked to control mechanisms. In one acquisition there had been a supplier that stopped providing their services after the acquisition was finalized, mainly due to resistance towards the acquiring firm, which led to value loss in relational assets. This could be connected to

a lack of contractual-based control due to a short notice period or due to a change of control clauses; however, it could also be connected to market power through a lack of mutual dependency, since the supplier was not dependent on the target firm for their own revenue and therefore were able to stop the supplies. Multiple respondents see clearance with the supplier before closing as an important means when the target firm is highly dependent on a supplier relationship to create value. Clearance with the suppliers entails contacting the supplier and clearing that they will continue the relationship after the acquisition is finalized. This was mentioned by multiple respondents, as more important than contractual-based control over the relational capital. In the acquisitions that relied on supplier and customer relationships, mutual dependency was mentioned by the interviewees as an important control mechanism. Hence, controlling the asset through market power. Mutual dependency was described as when the supplier and/or customer rely fully or heavily on the target firm for its revenue, which in turn provides the target firm with a type of market power. One interviewee specifically mentioned, " *It is always contractually hard to force someone to supply or purchase. But you do not always want to rely on contracts, because if that is needed, then that relationship is not going to last long anyways.*" This shows that even if the contracts regulating the relationships are well drafted, it does not necessarily mean that the relationship between the parties provides the necessary control to attain the value. Furthermore, multisource was also mentioned as a market power control mechanism to use to free yourself from a dependency situation within the relationships.

#### **4.4 Identifying and evaluating intellectual capital in an M&A process**

The primary identification and evaluation of the target firm's intellectual capital by the acquirer is in the data room of the due diligence process since this is when the target firm gets access to thorough information on the assets. Although, it has been mentioned by several interviewees that the due diligence process is never long enough for them to conduct the necessary identification and evaluation activities that they would want. M&A can also be seen as a two-sided problem. M&A needs to be kept confidential and there is a need for restricted access but at the same time, you need enough information to evaluate what it is you are buying.

A majority of the IP professionals, however, mentioned that activities related to the protection of intellectual capital mostly is an afterthought. Instead, the focus is on the firm's market share, financial data, or the product offering of the target firm. This was linked by some respondents to a lack of intellectual property as a driver for the acquisitions, even if the target firm heavily consists of intellectual capital. Another point connected to the identification is that it becomes more difficult when acquiring unsophisticated target firms since they themselves are unfamiliar with intellectual property rights connected to intellectual capital. In cases like this, intellectual property management can become a “cleaning up” process post-acquisition.

#### *Identifying and evaluating Intellectual Property*

Much emphasis in the M&A processes studied was put on evaluating the intellectual capital and how they are controlled by the target firm since “*it can make sure what you buy does not bring in risk*”. Furthermore, multiple respondents mentioned that it is difficult to handle any issues related to intellectual capital post-acquisition. In order to secure that the intellectual capital can be used in line with the motive of the acquisition, it needs to be handled before the acquisition in many cases. Examples from the study have been clearing third-party claims before the acquisition to hinder a lawsuit after the acquisition and managing/registration of intellectual property rights for new developments before they get disclosed.

*” The due diligence phase is a great opportunity to identify key persons, which products they are working on that they are planning to release so that they can prepare themselves and know which people to contact. If the target firm releases a new product before this happens, then the opportunities for good IP protection could be gone.”*

In relation to intellectual property in the pre-acquisition phases, many interviewees pointed out that what you want to look at with the IP before an acquisition depends on why you are acquiring. “*It goes to the point to why they are making the acquisition. The registration of the IP is not very hard to do in the integration phase, but you want to understand the strategy behind the acquisition to mitigate risks and save some of the IP if there is something important that has been done wrong*”.

Identifying and evaluation the IP in the pre-acquisition phases was specifically mentioned by one interviewee, mentioning it as being a proactive buyer versus a reactive buyer. *“There is a risk in not doing the IP activities: landscaping, product clearance, etc. In some cases, they might not have found the risks before the risk occurred post-acquisition, but it sets them up for failure when they don’t do it at all. Being invested early sets you up for success down the road, and when you know about the risk you don’t have to react and respond when the market comes after you.”*

From a timing perspective, identifying and evaluating IP sometimes need to focus on the discrete tasks that can be completed during the short time frame in the due diligence. The idea of viewing IP earlier in the acquisition phases can help the firm to better understand what they are buying and the potential risks, but it can sometimes be challenging to perform all the tasks. The difficulties can be related to the time aspect, what information is available publicly, and also what type of people are involved in the early stages of an acquisition. *“How the technologies fit into the portfolio sometimes needs to be done with the engineers, meaning if they are not involved in the process as well it can be difficult to evaluate the technologies we are buying”.*

Several interviews have also been discussed around the acquired patent portfolios. *“The number of times you look at the patent portfolio where the patents are not covering the important part is a lot. Then it is useless, and you spend a lot more money due to the purchase price going up based on patents when the patents are not of any value to us. Sometimes they only have filings on patents to look more attractive, but nothing registered, and sometimes that some portfolios are only for marketing, not for utilization”.*

Intellectual property has been frequently discussed in the interviews as something that becomes much more important when acquiring intangible-intensive firms and digital technologies. The importance of intellectual property in an M&A process was explained in one interview:

*“You can break down the technologies and look at the use of open source and which licenses that have been used to build the software you are acquiring. In some cases, it can be relevant to reprogram specific parts for a better IP position. Documentation is important to know if the competence is mainly in a specific person's head or if the*

*knowledge is explicit. It can be important to check the development side of the target during the process since that often is the engine and the creativity behind everything. There you can also collect a lot of information about how you could further develop the technologies, and at the same time find key people. This can also change the valuation of the target since you can find information that some technologies have a need for to be further developed to get what you want. This happens since there are costs related to developing the technologies after the acquisition. Around all of this, IP becomes an important part.”*

#### *Identification & evaluation of technology*

Furthermore, in terms of software the dependency is also evaluated if there are clear dependencies of technical frameworks developed by a third party, then there needs to be an evaluation of the investment will into that specific framework in terms of development community. This evaluation helps to identify risks with building the software on that technical framework.

Another evaluation of importance that was mentioned by an interviewee was evaluating the scalability both geographically and scaling the technology itself. In regard to geographical scaling, it becomes important to make sure that there is protection in the geographical areas in which the firm should be active in, and that a third party does not have protection in that geographical area in question. In terms of scaling the technology, it becomes important to first evaluate if they can integrate new modules into a software for example.

#### *Identification & evaluation of relational capital*

Relational capital in the form of value in customer and supplier relations of the target firm has been mentioned by multiple interviewees. However, one interviewee mentioned that to identify relational capital before the due diligence phase, public information needs to be used;” *We know if they have good customer relationships, it's easier to evaluate since its market knowledge. Similarly, we know what customers they have. We are in some cases also aware of the important (key) people, though reputation for example if they have talented engineers we will know.”*

To evaluate what customer relationship that holds the most value, looking at how large part of the target firm's revenue it consists of can be of help. When it comes to supplier relationships, the costs, quality, and speed of the supplies as well as how dependent the target firm is on specific suppliers can be used to identify valuable supplier relationships. In the evaluation of the customer and supplier relationships that are governed contractually, the clauses in the agreement need to be evaluated in the due diligence process. One specific clause that has been mentioned by multiple interviewees is change of control clauses, which is a risk to the value of both customer and supplier relationships. An interviewee mentioned; *"We need to identify where (in which contracts) there are change of control clauses. The biggest risk is when there is a change of control clause in a customer agreement, where the customer is a major part of the target firms' revenue stream."* A change of control clause can be formulated differently and provide different risk levels. Either it gives a right to the other party to terminate the contract upon notice, to terminate at the change of control, or an obligation for the party that is changing control to notify the other party of this.

Conclusively, the acquiring firm needs to identify the important relations in the target firm and evaluate what risk the formulation of the change of control clauses provides. This needs to be done both on the customer and the supplier side. The acquiring firm can in some cases initiate discussions with the customer and/or supplier before the acquisition is closed, and secure that the party will continue the relationship according to the agreement with the target firm pre-acquisition. Hence, mitigating the risk before closing. If the relationship is governed by mutual dependency, instead of contractually, this can also be mitigated through contacting the other party, as held in Table 3.

Furthermore, the acquiring firm needs to identify if the target firm has control positions in relation to the relational assets and what type of control positions exist. This evaluation is important to either conduct measures to ensure control before the acquisition is closed or create a plan of what measures need to be made after the closing.

#### *Identification & evaluation of human capital*

When identifying and evaluating the human capital in the target firm, different considerations have been emphasized. Multiple interviewees have stated that identifying key people is an integral part of the due diligence process, where they make

a list of all the key people. The value of identifying and evaluating the human capital was described by one interviewee as, *“for M&A it’s easy to get the patent portfolio, but what is behind the scenes? What has not been captured in patents? What are the land mines? What are people really working on? If the target firm has a technology with a specific coding language, they themselves don’t use, the people become important. The people from the target firm know what the history is, how the technology is created, and what it can do or be used for.”*

Key people are identified in different domains including operations, engineering, and sales. If the key asset is a specific product-related technology that is protected by patents, one way of identifying key inventors is to look at the most frequently mentioned cited inventors in the patents assigned to the target firm. However, if it is an unsophisticated target firm then it might be the owner that is the inventor for all patents. In this case, a more thorough investigation of the engineers involved in the creation of the technical solution can be made. If there are no patents, but there is code connected to a software it could be possible to identify key persons by looking at which coders contributed the most both qualitatively and quantitatively to proprietary code. Another way of identifying key people is to conduct interviews with the engineering team, CTO, and management. Based on this, the key people with technology-related know-how, or innovation & R&D-related capabilities to the specific product-related technology can be identified. What is important is to make sure to identify those individuals with technology-related know-how, since they have valuable knowledge of the technical solution or of the code that is valuable for the acquiring firm to use the technology in question in the intended way after the acquisition.

In terms of evaluating the human capital, one respondent mentioned that it is important to evaluate the future needs for competence related to the specific technology. More specifically in the cases of employees resigning, if they retire, or if they are contractors. Evaluations that can be made were outlined, *“what is the future, and what does the competence look like? How many new developers are being educated for the specific coding language, in which geographical areas are they in, and if there are contractors that could continue to develop the code for example? How expensive are the developers that are active? We create a roadmap forward; this is part of the roadmap.”*

# 5 Analysis

In this section, the findings in Chapter 4 are analyzed. This section is divided into three subheadings. In 5.1 the connection between the motives, key intellectual capital, and risk is analyzed. In 5.2 the handling of the intellectual capital is analyzed. In 5.3 the handling of the intellectual capital in the M&A process is analyzed.

## 5.1 The connection between motives, key intellectual capital, and risks

All relational, technical, and knowledge-based key resources are linked to specific risks and ways to mitigate them to make a successful acquisition. The motives also give an indication of what type of identification and evaluation the acquirer must do. For example, the motive of new geographical markets brings the importance of analyzing the external market, the scope of protection, and in which markets you have protection/can get protection. A new technology/portfolio diversification brings in many risks. Much focus lies on that the target firm got ownership of the technology, sufficient intellectual property rights, and that you can secure the related know-how to the technology. From the cases analyzed, it was also found that in relation to acquiring new technology and diversifying your portfolio, the acquiring firm in some cases actually acquires a relational asset that develops and supplies the technology rather than acquiring the technology itself. This means that you need to control the relationship rather than the technology since chances are that the target firm does not have any ownership and intellectual property rights to the technology.

As one of the main conclusions of this study's findings, keeping key people from the acquired firm is vital for a successful acquisition. When acquiring firms with complex technologies, the risk of losing key people has become even bigger. Although the acquirer purchases the rights to a technology as explicit as in a patent, the related know-how for the intended use and further development can either be essential or a value-increaser. The development of a software with a specific coding language can connect a person or a team of engineers to the utilization of the technology. Hence, acquiring technologies will in some cases be dependent on specific people for the value creation

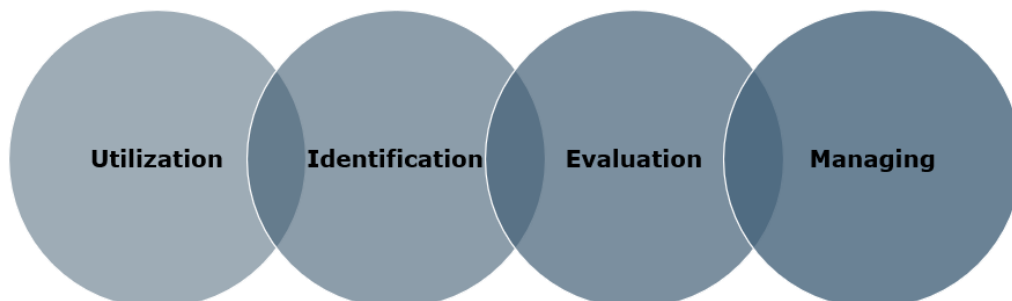
from the acquisition. Furthermore, losing key people also relates to losing relational capital since relationships can be hard to control and manage contractually. Some relationships depend on specific know-how and personal relationships, which risks losing value post-acquisition if key people from the acquired firm leave. In relation to acquiring intangible-intensive firms and acquiring new technologies, the capabilities, and know-how of the acquiring firm often do not match the target firm in the case when the acquirer is not a technology firm. Hence, many of the risks of losing people post-acquisition are related to an acquiring firm not possessing the internal capabilities and know-how required for developing and managing the acquired technologies and relationships. In conclusion, without the people from the acquired firm, what you originally paid for will not contribute to the competitive advantage intended from the acquisition.

In relation to the risks that were brought up, questions can be posed on if the acquirer successfully acquires firms because they are able to handle the intellectual capital-related issues, or if the acquirer cannot handle the issues but because the risk does not occur because of luck. Even if there is a risk at hand, it does not necessarily occur. However, it could be an issue in another acquisition if not handled.

Noticeable from the data is that the motive of acquiring a financially profitable firm was lower than other mentioned motives in the cases studied. A conclusion can possibly be drawn from the fact that when acquiring intangible-intensive firms, the focus lies on other important assets than financial ones and that some attractive acquisitions are still in the development phase, hence not financially profitable yet.

## 5.2 Utilize, Identify, Evaluate, Manage

According to Petrusson (2016), there are four processes in the IAM framework for managing research results: (1) Claiming knowledge assets and intellectual property assets (2) Evaluating and positioning assets in the external environment (3) Deciding utilization for the assets (4) Organizing knowledge assets, intellectual property assets and contracts within the organization. The utilization phase in this case refers to that the firm can decide how the assets should be utilized based on the roadmap created from the evaluation and positioning phase. This should be based on which internal resources and capabilities the firm possesses, also considering what obligations the firm already has and what restrictions there are internally and externally. From our findings though, where the target firm(s) have already been selected based on a utilization strategy, the order of the phases in the framework does not fit the M&A processes we have investigated. Instead, we have found that the phases including identifying and evaluating intellectual capital help answer the question of “Does the intellectual capital correspond to where we want to go?”. As it has been a common theme in most of our studied cases and interviews that the identification and evaluation of the intellectual capital must be connected to the strategy behind the acquisition, these phases are put after utilization. Thereby, the framework has been adapted to the following order: (1) Utilization, (2) Identification, (3) Evaluation, and (4) Managing (see Figure 14). The phases of the framework will be described in the following sections.



*Figure 12: Intellectual Capital Management in an M&A process. Adapted from Petrusson (2016) IAM framework*

### **5.2.1 Utilization of the intellectual capital**

The first phase of the framework, utilization of the intellectual capital, sets the end-to-end approach through the different phases in the framework. From an overarching M&A strategy and the answer to "Why are we acquiring?", this phase works as the foundation for and can be a roadmap for the following phases in order to identify and evaluate the intellectual capital and go through specific activities that can benefit the intended use. Hence, the utilization of intellectual capital is how the intellectual capital is intended to be used after the acquisition.

The utilization of intellectual capital springs from the motive behind the decision. Thereby the following needs to be considered by the acquiring firm; What is the motive behind the acquisition? Is it entering new markets, targeting a new customer base, or access to new relationships and/or knowledge? Also, since our findings show that all acquisitions studied wanted to achieve synergies from the acquisitions, it becomes important to break down what types of synergies are expected.

Breaking the intellectual capital down to what is meant in a strategic sense on an asset level, the following questions are important to answer before entering the next phases:

- What assets are most important for the acquisition?
- What is the intended use of the specific assets post-acquisition? Are we intending to further develop the acquired technologies, and in that case, what, how, and when?
- Which assets are we expecting specific synergies from, and how?

### **5.2.2 Identification of the intellectual capital**

In the identification process, the assets that are necessary to ensure the utilization of the assets post-acquisition is based on the motive of the acquisition. Furthermore, the control positions related to the assets should be identified to ensure that the acquiring firm has the potential of utilizing the acquired firm according to the motive for the acquisition. The identification process lays the ground for which assets to evaluate in the evaluation phase. Due to the time constraints in the Due Diligence phase, the asset & control position identification ensures that the time in the due diligence process is

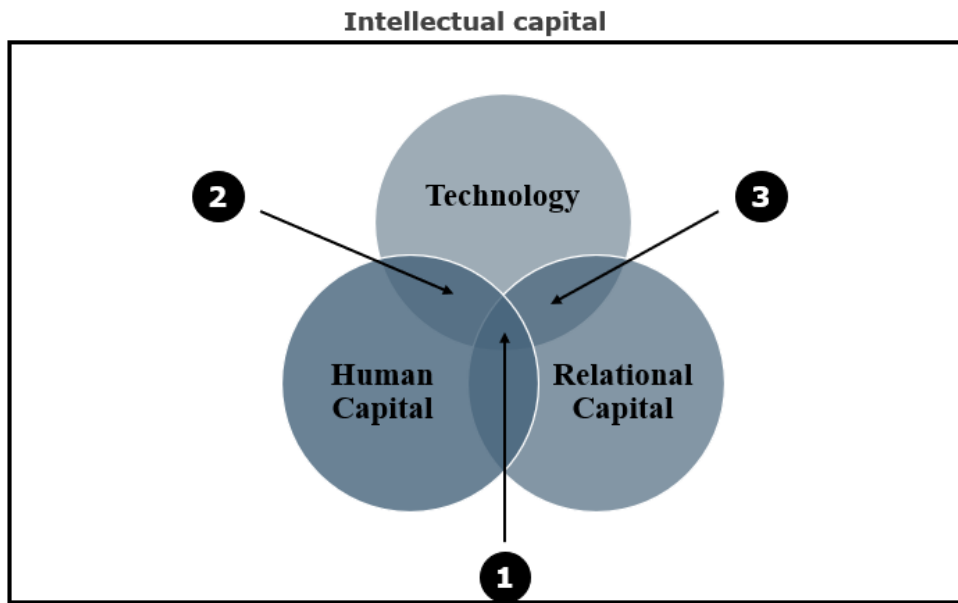
spent on confirming the evaluation of the valuable assets that are necessary for the acquiring firm's utilization possibilities.

To identify the technology-, human-, and relational capital that the intellectual capital consists of, they need to be identified separately. Firstly, the technology assets that the acquiring firm has that they want to utilize post-acquisition need to be identified. To identify the technology that a technology asset comprises, the technology should be broken down and semantically objectified as data, database, observation, theoretical framework, technical solution, instruction, visualization, software, or narrative (see the IAM framework in section 3.3.2). Secondly, the human capital and relation capital that is connected to the technology asset but not included in the above-mentioned should be identified. Thirdly, the control positions related to technology, human capital, and relational capital need to be identified and described. Furthermore, a determination of who has control claims needs to be made. This is exemplified in Table 4.

Table 5: Asset - Dependency - Control identification example

Technology assets	Technology break-down	Human capital	Relational capital	Control position
Technology (1)	Instruction Software Solution Technical solution	Technology-related know-how needed for specifications regarding the development of software. Know-how for managing relationships is needed.	Dependent on the supplier for the development of the solution and for supplying the solution	(1) No IPR for the technical solution and software solution (2) No contractual control for RC (3) No contractual control for HC (4) Design rights for solution
Technology (2)	Technical solution Software solution Data	Technology-related know-how needed for further development. Necessary to identify key persons.	-	(1) Patent registration for a technical solution. (2) Open-source code as part of the software. (3) Possible trade secret protection for data. (4) Partially contractual control for HC.
Technology (3)	Software Solution Instruction Database	-	Outsourced and developed by a third party.	(1) IP rights owned by target firm – copyright protection (2) Contractual control of RC.

The dependency between the intellectual capital is being visualized in Figure 15. The numbers in the figure relate to figure table 4.



*Figure 13: The intersection of the acquired intellectual capital*

Another important part of the identification of the technology is to identify the final actor of the chain of title. This means that the current legal ownership of the rights related to the intellectual capital rests with the target firm, both patent and copyright. This identification is to make sure that the target firm owns the intellectual capital so that there is no third-party claim to the asset which could hinder the acquiring firm to use the asset in the intended way. If the target firm does not own the rights connected to the assets, they of course cannot sell the rights to the acquiring firm. In relation to relational capital, it is important to identify change of control clauses in customer and supplier agreements, to ensure keeping the relational asset post-acquisition.

### 5.2.3 Evaluation of the intellectual capital

To ensure control over the complete intellectual capital including technology (innovation capital), human capital, and relational capital, different control mechanisms need to be used to create a competitive advantage.

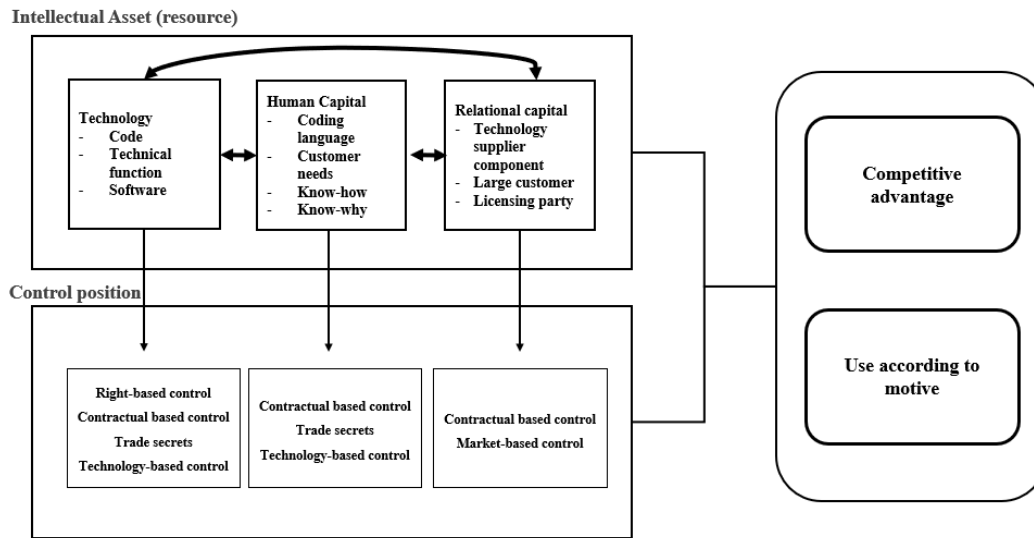


Figure 14: Controlling your intellectual capital to gain competitive advantage

Regarding the technology, there are multiple control positions available. However, depending on what technology it is, the possible control positions vary. The evaluation of the assets and their related control positions thereby needs to be made based on the nature of the assets and their possible control mechanism. The control position that the target firm has to the intellectual capital, may not provide a high enough control. There may be other control positions that provide stronger protection of the assets, thereby an evaluation can be made on which those control positions are and if it is possible to attain the control positions in question.

To utilize the intellectual capital in accordance with the motive of the acquisition and ensure a competitive advantage, the acquiring firm needs to make sure that there are necessary control positions in relation to the technology and the related human- and relational capital. If the intellectual capital lack the necessary control, the value, rarity, and imitability risk being lost, thereby not providing the competitive advantage wanted post-acquisition (Barney, 1991). In connection to human capital specifically, the tacit knowledge acquired has the potential to provide a competitive advantage in an

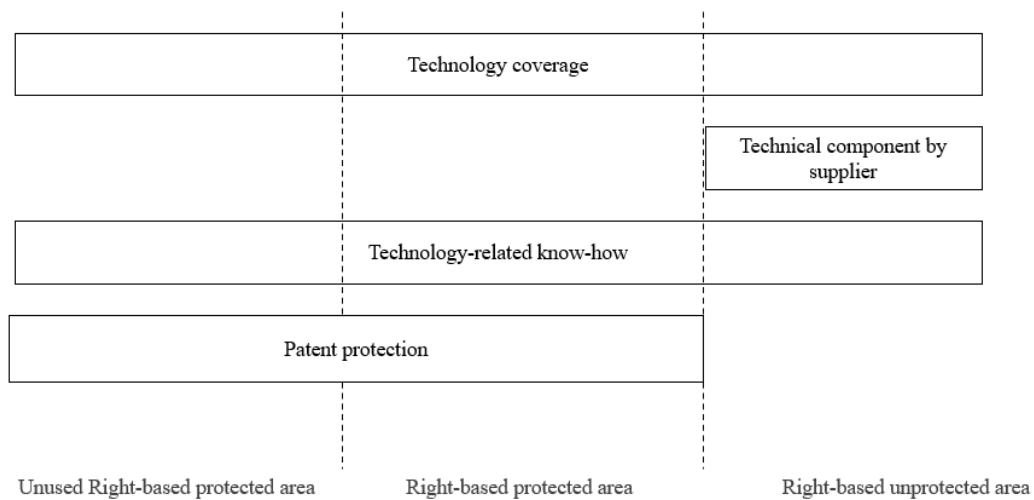
acquisition, as long as you can sustain the tacit knowledge within the firm. Without some type of control of the human capital, the knowledge necessary to create value and gain competitive advantage from the technology and/or relationship risks being lost (Grant, 1996). Conclusively, the target firm is acquired for its value-creating ability, if the value creation is not controlled, the acquiring firm cannot use it to create value after the acquisition. In order to make sure that the value-creating ability remains, the acquiring firm needs to make sure that the target firm has the necessary control positions to capture the value.

Another evaluation that is necessary to make is the connection between the different types of intellectual capital. How dependent is the technology of the relational capital? How dependent is the technology of human capital? How dependent is the relational capital of the human capital? Is the knowledge in the target firm necessary to keep the value of the relationships it has, or do we have the in-house competence?

From our findings, in several of the cases, there was a risk in that the acquiring firm lacked the technology-related know-how of the technologies they were acquiring. It was also seen as an important activity in the pre-acquisition phases to both identify and evaluate this in order to know which key people possess the know-how, and what the risk of losing them means. The question around this is, what is it that you lose if the know-how is not captured through the acquisition?

This connection between the intellectual capital is further described below and exemplified with a patent as a right-based form of control in Figure 17:

- (1) Right-based protected area - What from the technology is being used and covered explicitly in patent protection? Is there any tacit know-how related to the technology needed for utilization although it is covered explicitly in a patent?
- (2) Unused Right-based protected area - What is not being used from the technology, although protected, but that has the potential of being used? What is the related know-how needed to do this?
- (3) Right-based unprotected area – What is being used, but is not protected through an IPR? What is being supplied by another actor? What is the related know-how to handle the supplier, both to keep control of the asset and to provide possible R&D specifications for development?



*Figure 15: Technology, IPR, Human- and Relational capital overlap. Adapted and inspired by Chesbrough (2006)*

The figure illustrates the dependency between technology, human capital, and relational capital as well as the control necessary to cover all categories of intellectual capital. It also shows that the intellectual capital that is not covered by patent protection remains unprotected. However, as held previously, intellectual capital beyond patent protection may be equally as important to control in order to utilize a technical invention. The illustration thereby also shows that even if the firm owns the technology and the IPRs, it does not guarantee control to the full extent of what you are buying without human- and relational capital. Since both human and relational capital is closely linked to people, without them the firm does not really control the intellectual capital. Patent protection is only an example in the figure. Thereby it does not exclude any other types of control mechanisms, for example, trade secrets.

The control positions that the firm has may not cover the entire intellectual capital including necessary human capital and relational capital that is needed to utilize the asset according to the motive of the acquisition. It is thereby important to evaluate what part of the assets the control position protects. Other important assets may not be protected, which could be protected by other control positions. There may also be a technical component that is part of the technology as a whole that is outsourced to a supplier, this component may not be part of the patent-protected area, and without any form of related control position. This is illustrated in Figure 17 when there is patent protection of part of the intellectual capital, but there is human capital and relational

capital. The part that is unprotected may be infringing on a third party's protection, but it also entails that this value can be lost after the acquisition. The part that is unused may be a potential source of value, that can be used by the acquiring firm. Thereby it is important to evaluate the connection between the scope of protection of the control position and what part of the asset it protects.

Based on the control positions the target firm has of the intellectual capital, the degree of control must be evaluated based on how the acquiring firm wants to use the assets after the acquisition, see Figure 18. For example, if the acquiring firm wants to scale a patent-protected software to another geographical market, then it needs to make sure that the target firm has patented in that geographical market or that the target firm is not infringing on a technology that another actor has patent protection for in that same geographical market.

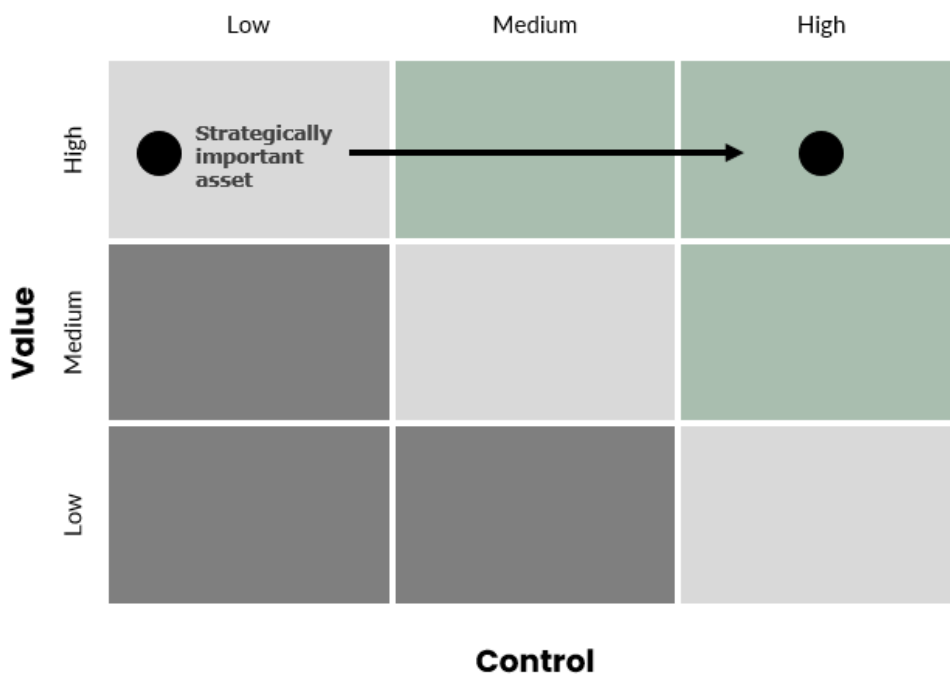


Figure 16: Visualization of the degree of value and control with an asset

If the intellectual capital is of high value for the acquiring firm, it should have a high degree of control. If the target firm has a weak (low) control position, the acquiring firm should aim to create a strong (high) control position in relation to the asset, if this is possible.

In relation to evaluating the external environment, this activity becomes easier to perform since you have already identified the important assets in the target firm and evaluated their control positions. From this position, you can benchmark your assets against other external actors, and gain a picture of how strong your position on the market can become post-acquisition.

Firstly, an investigation of external actors' technologies in the same research field can be made to evaluate which other actors are competing within the same technology field, as well as evaluate the target firms' competitiveness in the technology field.

This allows for an analysis of what part of the field the firm can operate freely and where it cannot due to the control positions of other actors within the field, hence mapping the actors with the most important control position and the firms' own control position within the field. This can be used to determine how the firms' control positions can be utilized and how the control positions can be developed. As a conclusion, this analysis can raise awareness of risks in relation to IP competitors and litigation activities and provide a picture of how strong your position is to mitigate these risks.

#### **5.2.4 Management of the intellectual capital**

In many cases, issues related to intellectual capital must be handled before the acquisition to secure that the intellectual capital can be used for the intended utilization. According to Petrusson (2016), the management phase comes down to three things: (1) Management of knowledge assets (2) Management of intellectual property rights (3) Management of contracts and relationships.

In the M&A setting, the findings of the due diligence phase can be used by the acquiring firm to create a plan for how intellectual capital should be managed post-acquisition. For example, which are key persons in need of incentives, what registrations are necessary, and what products in the R&D stage need better protection? Furthermore, the acquiring firm can mitigate the risks found in the earlier phases before signing the SPA in various ways. For example, through clearing third-party claims to mitigate the risk of a lawsuit after the acquisition and management/registration of intellectual property rights for new developments before they get disclosed.

If contracts with suppliers or customers include change of control clauses, the acquiring firm can manage this risk by contacting the suppliers and customers to ensure that the contract will continue to regulate the relationship post-acquisition. This means that the acquiring firm can secure relational assets remain after the change of ownership in the acquiring firm.

In conclusion, this phase can be characterized by risk mitigation and planning for the integration phase of the intellectual capital.

### **5.3 Intellectual capital management in an M&A process**

When applying the utilize, identify, evaluate, and manage criteria from Petrusson (2016) to an M&A process, some adaptations had to be made. The utilization of intellectual capital in practice is decided through the motives of the acquisition. The motives are in turn set by the M&A strategy of the acquiring firm. The motive of the acquisition furthermore shapes the choice of the target firm. Hence, the utilization of the intellectual capital should guide the following identification, evaluation, and management processes in order to make sure the acquiring firm can utilize the intellectual capital in the intended way.

In order to visualize the intellectual capital activities that are necessary to conduct in relation to the utilize, identify, evaluate, and manage criteria, specifically in an M&A they are mapped out and related to general M&A phases in Figure 19.

The legal contracts are important since they affect both the insight into the information of the target firm and to what extent each intellectual capital activity can be conducted. Thereby, the phases have been split based on the legal agreements. When a non-disclosure agreement is signed, the acquiring firm has access to sensitive information of the target firm. Before the letter of intent has been signed, multiple target firms could be considered by the acquiring firm. With the letter of intent, the target firm and the acquiring firm commit to good faith in the negotiations, and a wish to fulfill the transaction. Normally it is not a binding agreement, however, it could be binding if the clauses have been formulated to be binding. Thereby, particularly sensitive information

would normally not be available for the acquiring firm until the letter of intent has been signed. After the letter of intent, the acquiring firm can perform due diligence, where they get access to a data room with information of the target firm. Before the data room is open, they can send a request list with documentation or other information that they want to be included in the data room. The share purchase agreement is a binding agreement between the target firm and the acquiring firm, which finalizes the sale of shares of the target firm. The due diligence and negotiation & signing are split into two phases since the identified risks in the due diligence phase can be handled in the negotiation and signing phase for example through representations and warranties or indemnification clauses. Furthermore, the risks and evaluations conducted in the due diligence phase can be used to lower the purchase price. Thereby in the negotiation and signing phase, the acquiring firm can lower the risk after the acquisition.

The framework has been built based on transforming the acquiring firm from a reactive to a proactive buyer, by placing the Intellectual Capital activities earlier in the M&A phases. Laying the groundwork for the acquiring firm to have time to thoroughly investigate the intellectual capital of the acquiring firm and be aware of the risks that the acquisition entails early in the process. This allows for mitigative action to be taken before the SPA is signed. Thereby, a proactive buyer is prepared and aware of the risks in comparison to the reactive buyer that has to react and respond when the risks arise or when a third-party “knocks at the door”.

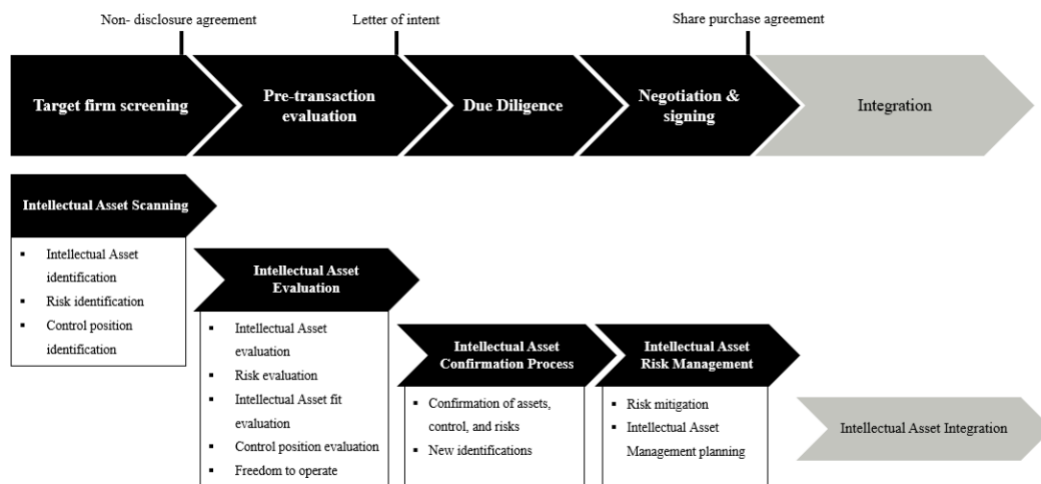


Figure 17: Intellectual Capital Management in an M&A process. Adapted from Farhadi & Tovstiga (2010)

### *Intellectual Capital Scanning*

In the *Target firm screening phase* of the M&A, multiple target firms can be in considered for the acquisition. Since neither a non-disclosure agreement nor a letter of intent has been signed in this phase, the acquiring firm does not have access to confidential information. However, there is public information available, for example through market knowledge from the engineers working at the firm or of the customer or suppliers the target firm has and the registration of assignee and inventor of patents in patent databases. This means that a preliminary *asset identification* can be made. For example, solutions from the target firm can be identified through patent databases to identify the part of the technology that the target firm possesses. Similarly, based on the number of times the same inventor has been cited in the patents, assumptions regarding key people that possess technology-related know-how in relation to the technology can be made. Based on the present and past assignees of patents, the chain of titles can also be mapped.

Based on public information, right-based control positions in the form of patents and design rights can be identified in relation to the identified assets.

Based on the identified assets and control positions, *risk identification* can be made to flag risks related to intellectual capital. For example, if the assignee of the patent is another actor than the target firm or if the patent is close to its expiration date.

The following questions can guide the acquiring firm in the *Intellectual Capital Scanning*

- Is there a match between the acquiring firm's technology portfolio and the possible target firm's technology? Does it complement the pre-existing one?
- Do the target firm's intellectual capital fit the intended utilization?

### *Intellectual Capital Evaluation*

In the *Pre-transaction evaluation*, there can still be multiple target firms for consideration. Thereby, the following evaluation can be applied to multiple target firms. Since the letter of intent has not been signed at this time, it will be difficult to access confidential information from the target firm. However, based on the identification conducted in the *Intellectual Capital Screening*, an evaluation can be made of the

intellectual capital, the risk connected to the intellectual capital, and the control positions that the target firm has in relation to the intellectual capital.

The evaluation of the intellectual capital and risks related needs to be seen in the light of the intended use of the assets, which means if the identified assets are sufficient to use in the intended way and if the risks related to the assets hinder the intended use or not. If the risks are hindering the intended use of the intellectual, an evaluation of how high the risk is and what impact on the utilization the risk can have should be made. Furthermore, an evaluation can be made of if the risks could be mitigated or not before signing the share purchase agreement. If there is a possible risk, this can be confirmed in the following confirmation phase in the due diligence process.

A specific risk that can be identified in this phase is if there is any litigation activity within the technology field and in relation to the control positions of the intellectual capital. For example, if there have been infringement proceedings against the target firm or other litigation that is connected to the intellectual capital.

An external landscape analysis can also be made based on other actors' registered patents. This allows the acquiring party to evaluate the IP competitors that are active in the technology field. The landscape analysis can also be used to do a *freedom-to-operate analysis*, which entails mapping out in which area the target firm can operate without infringing on a third party's patents. Thereby evaluating the risks that it entails for the target firm to operate in the technology field.

When evaluating the control positions, the scope of protection should be related to what the assets want to be used for by the acquiring firm. Depending on how the acquiring firm is planning to utilize the intellectual capital, there is a need for a different level of control. The first step should thereby be an evaluation of what control positions are necessary for the intended use. This entails both the evaluation of what control positions the target firm currently has, and what potential control positions that are possible for the acquiring firm to attain.

The following questions can guide the acquiring firm in the *Intellectual Capital Evaluation*

### ***Freedom to operate***

- *IP competitors: What competitors are active in the same technology field(s) that the target firm is operating in? What protection do they have?*
- *Direct competitors: What actors are directly competing with the products or services? What protection do they have?*

### ***Intended utilization***

- *What technology- knowledge- & relation assets are needed to use the technology in the intended way?*
- *Can we control the assets in order to utilize them? What control is necessary for the intended use?*
- *What risks have been identified? How high is the risk? How does the risk impact the intended use?*

### ***Intellectual Capital Confirmation Process***

The *Intellectual Capital Confirmation Process* is part of the due diligence process, where the acquiring firm has access to confidential information in the data room. This phase thereby allows for the acquiring firm to analyze details that were not possible before.

Based on the intellectual capital scanning and the intellectual capital evaluation, specific documentation related to important assets and risks can be included in the request list for documentation available in the data room. This ensures that the documentation needed to confirm the findings is available for the acquiring firm to achieve a thorough due diligence process, that is focused on the intellectual capital and related risks that are essential for the intended use of the assets. Naturally, it should include documentation of risks that could not be identified in the public information, such as employment agreements, IP assignment agreements as well as supplier and customer agreements.

In the data room, the acquiring firm can conduct a more thorough review of the assets and risks from the earlier processes to confirm the findings and break down the technology assets (see section 2.3.2). If the target firm has made statements regarding the intellectual capital, risks, or control positions related to the intellectual capital, these

can also be confirmed to be true or untrue in this phase. The acquiring firm can also identify new risks based on information that could not be obtained through public information in the same phases. For example, identifying if the IP has been transferred from the inventor or creator to the target firm, and identifying important supplier and customer agreements based on how dependent the target firm is on these third parties. Furthermore, change of control clauses can be identified in these mentioned agreements.

Based on the findings in the data room, the acquiring firm can conduct interviews with employees at the target firm, if the documentation in the data room did not provide the necessary clarity. The acquiring firm can also contact suppliers and customers that they have a dependency on, to secure a continued collaboration after the acquisition.

The following questions can guide the acquiring firm in the *Intellectual Capital Confirmation*

- *What is the scope of work for the Due Diligence based on the intended use and the identified assets of importance?*
- *What findings in the pre-transaction identification and evaluation can be confirmed based on the detailed information?*
- *What risks were identified in connection to technology- relational- and knowledge assets?*
- *How high is the risk?*
- *Are the high risks related to markets that the acquiring firm wants to operate in?*

#### *Intellectual Capital Risk Management*

In the *Negotiation & signing phase* the acquiring firm should focus on acceptable risk, possible risk mitigants, and how the intellectual capital should be managed after the SPA.

In terms of acceptable risk, naturally, it is not possible to reduce all risks related to intellectual capital. However, the risks that could have an impact on the intended use of the assets needs to be handled in this phase. This could be done by contractually transferring the risk from the acquiring firm to the target firm in the SPA. Or by

indemnification clauses for identified risks and include representation & warranty clauses for risks that have not been identified in the M&A process. Furthermore, stand-alone agreements could be made with possible third parties with claims to the intellectual capital. For example, IP assignment agreements transfer the ownership of a patent from an inventor to the target firm.

In terms of creating a plan for the integration of the assets, this can include what major and minor activities need to be conducted after the acquisition. For example, registration of IP rights to the acquiring firm, and capturing knowledge and new R&D activities through harvesting. An important part is to plan for the transfer of rights connected to the intellectual capital post-closing, for example transferring the ownership of a patent from the target firm to the acquiring firm or the usage right related to licensed technology. It could also include how to handle external IP owners post-closing and start to outline what Intellectual Capital Strategy the acquiring firm could have post-closing.

The following questions can guide the acquiring firm in *Intellectual Capital Risk Management*

- *What potential risk mitigants can be used to lower risk?*
- *What risk mitigants should be included in the SPA?*
- *What major activities need to be conducted to integrate the Intellectual capital post-closing?*
- *What other minor activities need to be conducted to integrate the Intellectual Capital post-closing?*

## 6 Conclusions

In this section, the study's conclusions in relation to the main research question will be presented.

*How can intellectual capital management impact the outcome of acquiring an intangible-intensive firm?*

To understand how intellectual capital management can impact the outcome of an acquisition, it is first necessary to understand the strategic motives behind the acquisition and what the intended use of the intellectual capital is. The study has shown that the motives behind the acquisitions were (one) to achieve synergies, (two) to attain new technologies as well as acquire intellectual capital in the form of (1) technology-related know-how, (2) innovation, and R&D capabilities, and (3) getting access to valuable supplier- and customer relationships. The gathered data showed that the intended use of the target firm was to (i) enter new geographical markets, (ii) capture knowledge about new technology and markets, as well as (iii) further develop the acquired technologies.

In order to keep the value of the acquired assets, the acquirer needs to avoid the risk of losing individuals that possess relevant technology-related know-how, R&D capabilities, and tacit knowledge regarding how to manage the relational capital in the form of customers and suppliers. Furthermore, the acquirer of the intellectual capital is subjected to many risks in relation to the connected intellectual property which can end up in costly litigations or being unable to use the acquired assets due to third-party claims. A lot can go wrong for the acquiring firm in an acquisition in relation to understanding what it is you are buying, ensuring sufficient control, and the post-acquisition use of the assets. These risks can occur through acquiring, for example, new complex technologies outside the acquiring firm's usual scope, through unsophisticated target firms with insufficient IP portfolios, or through acquiring purely relational- or knowledge-driven firms with low control of the intellectual capital.

By using a proactive approach to identify, evaluate, and manage intellectual capital in the M&A process pre-closing, the acquiring firm can more easily understand intellectual capital and its related risks. The proactive approach is outlined in an intellectual capital management framework with four phases, (1) Utilization (2) Identification (3) Evaluation (4) Manage. To be able to have a proactive approach, the acquisition strategy, the motives, and the key intellectual capital all must be communicated and connected throughout the entire M&A process. Hence, (1) Utilization, refers to connecting the acquisition strategy with the intellectual capital activities throughout the M&A process. To utilize the intellectual capital in accordance with the motive of the acquisition and ensure a competitive advantage, the acquiring firm needs to make sure that the acquired technology and the related human- and relational capital have the potential to achieve the expected objective. Hence, (2) Identification and (3) Evaluation, refers to an early-stage (i) identification and evaluation of the intellectual capital, (ii) its risks, and (iii) its control positions related to the strategic objective. Conclusively, the target firm is acquired for its value-creating ability. If the value-driving assets are not specifically managed in the process, the acquiring firm risks not being able to sustain the value post-acquisition. Therefore, the acquiring firm needs to make sure that the target firm has (i) sufficient control over the intellectual capital, (ii) that all the crucial risks are cleared, as well as (iii) a future plan for how to manage the assets. Thereby, (4) Manage, refers to either conducting measures to ensure this before the acquisition is closed or to create a detailed plan of what measures need to be taken after the closing.

## 7 Further research

Since this study has been limited to the M&A phases pre-acquisition, further research on how intellectual capital management can impact the integration phase would be interesting to investigate. A question this study does not answer is how you need to manage your intellectual capital post-acquisition in order to retain the assets.

Furthermore, the impact cultural differences between the acquirer and the acquired firm have on these types of acquisition is not covered in this study. Interesting further research would therefore be to investigate what cultural differences make in keeping valuable human capital and the retention of intellectual capital. As well as how to best manage this.

In this study, motives and risks in acquisitions have been qualitatively investigated in seven cases. To gather a more overarching view, a study could be conducted focusing on a larger set of cases to gather a bigger database. This way, better conclusions could be drawn as to why acquisitions succeed or fail, and better be able to draw connections to which risks need to be handled in order to succeed.

Conclusively, the study has investigated innovation-, human-, and relational capital. Since these do not cover all types of intellectual capital, including other types of intellectual capital such as organizational capital, brands, and data assets can provide a broader picture of how to manage the intellectual capital in an M&A process.

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