



LUND UNIVERSITY
School of Economics and Management

Staying innovative: a quest for innovation through knowledge sharing and integration

by

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May 2019

Master's Programme in Managing People Knowledge and Change

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Abstract

- Title** Staying innovative: a quest for innovation through knowledge sharing and knowledge integration.
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- Date** 24th, May 2019
- Aim** The aim is to develop a profound comprehension of what role knowledge plays in the process of integrating the internal knowledge within organizations with the external knowledge that can be found in the surrounding cluster initiatives.
- Methodology** This research contains a qualitative case study which was developed by following an interpretative, abductive approach that granted the authors to work with theory and empirical material at the same time. Also, collectively ten semi-structured face-to-face interviews were conducted at our case company Tetra Pak with an additional questionnaire which was provided to us by one of the interviewees in order to build groundings of this thesis.
- Theoretical framework** This thesis outlines research in several areas such as the concepts of innovation and knowledge along with research on learning organization, clusters, knowledge integration and the SECI model to showcase how they can be combined in a specific context.
- Contributions** This paper contributes to the fields of knowledge management and cluster theory by explaining how Tetra Pak works with internal knowledge and the integration of external knowledge and how they are consequently shared in the company to support innovative work.
- Keywords** Innovation, internal & external knowledge, knowledge integration, knowledge sharing, clusters

Acknowledgement

First and foremost, we would like to thank our supervisor, Anna Jonsson for assisting us throughout our journey by provoking us to create new lines of thinking regarding our topic as well as providing valuable feedback. Thank you Anna for challenging us to contribute to a greater extent in terms of our initial ideas and for providing opportunities where we could discuss our topic to better understand it. We are truly grateful for having you as a supervisor, especially since you helped us turn something very vague into something more concrete which could actually benefit the academic fields.

Secondly, we would like to say a special thank you to Tetra Pak and our interviewees throughout the whole process. Especially to Camilla Hägglund who helped us get in touch with the majority of our interviewees. Without your help, we would not have been able to accomplish this study. We could definitely feel a very friendly atmosphere from the people at Tetra Pak and throughout our interviews. We do appreciate that we got the opportunity to catch a glimpse into this huge company in this challenging period. We are intrigued by seeing the future of Tetra Pak and how the company will answer the upcoming challenges. Thank you!

We would also like to thank our sister-group for providing insightful comments and feedback during our meetings which also provoked our way to think about the chosen topic.

Last but not least, thank you goes out to our families for their support and encouragement.

We really hope that you as a reader will find this thesis intriguing and encouraging to always look out for opportunities to integrate and share internal and external knowledge in order to grow in the future.

The image shows two handwritten signatures in black ink. The signature on the left is 'Måns Widenborg' and the signature on the right is 'Daniel Lajko'. Both are written in a cursive, flowing style.

Måns Widenborg & Daniel Lajko

24, May 2019

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1 Introduction

Very few would probably argue against the claim that competitive advantages create successful companies. Whether the success stems from the products themselves or the subordinates in the company, success is something unilateral that every company strives towards in any form or aspect. From the author's own experiences, success has often been associated with innovation and the capacity to innovate. Although innovation is a vague concept that is highly dependent on the context in which it is being used – a quick search online tells the eager researcher that innovation is an extensive concept. However, it seems as the concept is used universally and does not need a thorough description as seen in the works of Schmitz and Strambach (2009) where the authors do not even try to explain what innovation truly is. In another study on innovation in regions and clusters, Turkina, Oreskin and Kali (2019) point to other studies' explanation of innovation as being crucial for organizational survival and organizations ability to absorb new knowledge. However, in order to rest any confusion, we have adopted the definition of the word as something new - a new idea, method or product (Oxforddictionaries, 2019; Cambridge Dictionary, 2019) Yet, what is apparent is the strong connection between innovation and knowledge.

Drucker (1993, p. 54) comprehends that “knowledge has become the key economic resource and the dominant – and perhaps even the only source of competitive advantage”. Especially, as it is argued that the “knowledge-based view” of a company suggests knowledge as the key principle for competitive advantage (Easterby-Smith & Prieto, 2008; Hislop, 2013). In addition, evolution and expeditious advancement of communication and information technologies, services and networks have in turn increased the significance of innovative knowledge in economic improvement (Carrión, González & Leal, 2004; Beijerse, 2000; Tseng, 2009). Thus, organizations have to manage their knowledge in order to maximize their proficiency, productivity and effectiveness as well as to obtain a competitive edge to be profitable and successful (Singh et al., 2006; Holt et al., 2007). The importance of knowledge management is also key to innovate according to López-Nicolás and Meroño-Cerdán (2011) where knowledge is a vital asset for organisations to stay competitive in the 21st century business world. Nevertheless, these arguments illustrate the uncertainty and complexity that knowledge represents. Individuals' experiences, decisions and actions need to be highlighted and taken into account in relation to different types of knowledge (Easa, 2012). Therefore, managing knowledge is and will be a complex and challenging task to maintain, handle and to successfully achieve on an everyday basis. “Knowledge is embedded in ongoing practice, so

capturing it requires the practices themselves to be organised somehow” (Dougherty, 2004, p. 35). That practice represents how people get work done and their ability to put “know-what-how-why” into action.

The increasing importance of knowledge and its property of enabling competitiveness and perhaps, more importantly, innovation, created an interest to delve deeper into knowledge and how it is integrated and shared within the company of Tetra Pak. Tetra Pak positions itself as a front-runner in the food and beverage packaging industry with a very clear focus on quality assurances connected to sustainability (Tetra Laval, 2019). Innovation is the cornerstone for the company and is expressed as:

“Innovation means transforming knowledge into new products and services or into new processes and new working methods. Striving for renewal, or innovation is one of the most important driving forces in the global economy.” (Tetra Pak, 2019/a)

The emphasis on knowledge and innovation as shown in the above quote has consequently created an interest in the company and how the work with knowledge affects its daily work towards reaching innovation. Consequently, in the case of Tetra Pak, the story begins not from a lack of innovation, nor from a lack of organizational knowledge or competence, but rather from having decades-long monopolization in the food and beverage packaging industry. This act of having monopoly was established by the company’s early innovations e.g.: the *Tetrahedron package*, which was successfully patented, thus decades of longevity came in terms of its products and services. Nevertheless, after several successful decades, entrepreneur-minded competitors started to arise and began to challenge the company. The rather abrupt rise of competition was enabled by the expiry of several Tetra Pak patents, as ideas or products that were previously patented were no longer protected by patent laws.

“We had a patent on the patent in terms of the package bottom for 20 years – technical patent, it means that it forces every competitor to buy packaging material directly from Tetra Pak for that reason. However, that patent is expired and thus it’s gone. Consequently, the company has lost a big fixed income of money.”

Moreover, not only did Tetra Pak lose important patent rights, but additional external pressures that had been built up in the last couple of years became more imminent. For instance, the need for environmental protection called for sustainable solutions and put very heavy

pressure on the company in various forms. A very recent pressure is the ban on one-time-use plastic straws which in turn have created a new search for what could be innovative. Comprehending these events and external pressures brought our attention to examine the opportunities that the company's Swedish location can potentially provide in the search for innovation. Tetra Pak's Swedish branch is situated in the city of Lund and more importantly in the region of Skåne. Since a longer period, Tetra Pak has been working closely with Lund University in various ways, and through collaboration with the university's engineering programmes tried to attract students and new external knowledge to the company. One such example is the "Industry meets Academy" where scientists from the university hold lectures for employees at Tetra Pak (Lund University, 2018). As knowledge has become the utmost asset for innovative work and gaining competitiveness, it is hardly surprising that such collaborations exist in an environment that promotes knowledge sharing. This environment is in other terms what the region of Skåne calls a "cluster environment" and is supposed to encourage knowledge sharing between companies, the state and the university with a goal to further enhance the region's own competitiveness and innovative capabilities (Skåne, 2016). These forms of environments for sharing knowledge is also discussed by Etzkowitz (2003) under the label of "triple helix". The triple helix is meant to act as an innovative tool via collaboration between universities, governments and industries (Etzkowitz, 2003; Skane, 2016). The author further stresses the management and circulation of knowledge within the collaboration and how knowledge through this collaboration is utilized based on scientific knowledge being considered as an "economic enterprise" (Etzkowitz, 2003, p. 2).

The concept of clusters has been researched thoroughly but has according to Turkina, Oreshkin and Kali (2019) been largely focused on the emergence and development of clusters. In their study, they instead shift the focus to innovation and its importance and influential role for companies alike in cluster environments. The importance of innovation and its connection to how companies could and should utilize external innovation is emphasised in a Ted Talk by Michael Ringel (Ted, 2017). Through his role as an innovation instigator, he explains how organizations should learn to tap into the external environment to find innovative ideas to enhance the organizations' work. Also, research has shown that the member companies in the cluster initiatives believe that membership has increased their competitiveness and also enabled increased cooperation with industry colleagues and with academia, incubators and companies in other industries (Piore & Sabel, 1984). In a more comprehensive study by Berggren et al. (2011), the idea behind the very process of innovation is largely explained by knowledge integration in order to achieve competitive advantages. The authors point to three impactful

trends that steer the innovative work and knowledge integration for firms. First is the internationalization of R&D (research and development) and production. Secondly, the transformation of national and global markets. The third and last trend is the changes in the character of developments in science and technology which puts emphasis on speed (the time it takes from development to selling a product), specialization (focus on core competencies) and complexity in the work for companies. The study has consequently highlighted several interesting areas for academic research related to knowledge work and innovation by considering the external environment and its effects on the increasingly important work with both internal and external knowledge. As Tetra Pak is seen as an innovative company it is increasingly interesting to understand how the knowledge is integrated and shared within Tetra Pak in efforts of staying innovative and competitive.

However, not all organizations do operate within these collaborative forms and are not able to utilize the form of knowledge that cluster environments can offer. Thus, looking at Tetra Pak and its environment with strong ties to academic research and regional efforts to enhance competitiveness, the case can give valuable insights in the integration of different forms of knowledge and how they can contribute to innovation. Therefore, the idea of knowledge integration stemming from this perspective will serve as a delimitation for this paper. Also, the scope on how knowledge integration can be influenced via involvements in the above-mentioned environment is a fundamental interest of this thesis. Furthermore, by adding this contextual filter on knowledge integration and knowledge sharing within the firm, the authors can add a more nuanced perspective on knowledge.

To conclude, we see the necessity to a further comprehension of the theoretical development that focuses on knowledge integration by addressing a context-specific influence on knowledge. Therefore, our **aim** is to develop a profound comprehension of what role knowledge plays in the process of integrating the internal knowledge within organizations with the external knowledge which can be found in the surrounding cluster environments. Based on the paper's **aim**, we formulated the following research questions in order to guide this research:

- How can knowledge sharing, and knowledge integration be combined and understood to create company innovation?
- How do companies operating in cluster environments integrate external knowledge to strengthen their innovative and competitive capabilities?

1.1 Composition of the Thesis

This thesis is structured into six sections: Introduction, Literature Review, Methodology, Analysis, Discussion and Conclusion. This first section has presented the background and the necessary information to the problematization of this paper, as well as highlighted the authors' research aim and research questions. Whereas, the second section introduces the theoretical background in which we highlight and discuss the concept of innovation and the concept of knowledge. Consequently, we shed light on the relationship between knowledge and innovation. While for the fundamental understanding of the aim of this paper we lay out the theory of learning organization and knowledge culture, as well as presenting the concept of clusters. Furthermore, the external sources of knowledge is described, leading to the focus on knowledge integration, and how the SECI model induces and assert the nature of organisational knowledge creation. As a conclusion of the second section, we summarise the theoretical part and showcase the interplay between various parts in the quest for innovation.

In the third section, the authors will highlight and discuss the applied methodology and method in order to explain the fundamental ontological and epistemological groundings. Furthermore, the research design and process are introduced along with our case study which is presented with the support of explaining how we have collected and analysed the empirical data. As a last remark, we reflect on our collected material and state its limitations. The fourth section starts with a succinct overview of the case company's underlying environment after which the empirical data is thoroughly analysed. Consequently, the authors present the empirical data in various categorized parts in order to answer their research questions of how knowledge integration and knowledge sharing can be combined and understood to create company innovation as well as how companies operate in cluster environments and integrate external knowledge to strengthen their innovative and competitive capabilities. Last but not least, the fifth section presents the discussion where the collected empirical data is interpreted and linked to the theoretical background. Finally, in the last section, the main findings are summarized as well as the theoretical and practical implications are underlined along with recommended future research areas.

2 Theoretical background

This section introduces the theoretical background to provide a comprehensive examination of a set of chosen theories. Firstly, the authors feel compelled to conceptualize innovation as well as knowledge. Subsequently, the relationship between knowledge and innovation is understood to facilitate the importance of this paper. Followingly the learning organization and knowledge culture along with the clusters and external sources of knowledge are defined. Furthermore, this section aims to underpin the notion of knowledge integration and the SECI model through which the reader can have a firm grasp of the various perspectives towards the quest for innovation. Finally, the authors showcase the interplay between different parts in the theoretical background in such scenarios which will provide a fundamental conclusion of this section.

2.1 Innovation as a concept

According to Xu et al. (2010), innovation covers the whole organisation, from the conception of an idea to the introduction of a product or service on the market. Also, the authors comprehend that innovation is a process in which valuable ideas are transformed into new forms of added value for the organisation, employees, stakeholders, suppliers, and customers. Ease (2012) also comprehends this transformation as a learning process for the organisation as a whole to safeguard continuity and cohesion on the basis of innovation based in turn on creativity. Creativity is often identified as a personal asset according to the author. However, for organisational innovation, it is not enough that every employee as such wants to be creative. Instead, creativity should be recognised as a collective method to raise the level of potential innovation of the organisation (Ease, 2012). In addition, the “fine-tuning” between individual and collective transformation is crucial for organisational innovation (Merx-Chermin & Nijhof, 2005). Furthermore, Hobday (2005) underlines that innovation might be described as a product or process new to the company, and not simply to the world or the market. Similarly, Rogers (2003) and Assink (2006) defined innovation as the adoption of ideas that are new to the company, or as the process of successfully creating something new that has significant value to the relevant unit of adoption. Also, Kaufmann (2004) emphasised that an idea deserved to be defined as innovative should it be novel for the individual who produced it, without necessarily being novel for society as a whole. Therefore, if innovation was described as the first economic/business introduction of a process and product in the world, there would be very

few achievements that might be labelled as “innovative” in organizations (Khorakian, 2011). Consequently, it is comprehended that innovation as an activity involves uniqueness and considerable novelty for the adopting company, however, it is not necessarily new to the world.

Innovation can, therefore, be understood as a broad concept, relating very heavily to the context of where it is being mentioned. However, as stated in the introductory part of the thesis, innovation is deeply connected to knowledge. Therefore, we will departure into the domain of knowledge.

2.2 Knowledge as a concept

According to Wiig (1997), the historical developments of economic pursuits and interests, concluding in the information revolution and the reappraisal of the significance of knowledge have led to today’s magnitude of knowledge management (KM). The author also highlighted that the necessity to focus on managing knowledge results from both market-driven and economic conditions which are created by international competition and customer demands. The notion of knowledge as a competitive tool is also emphasised by Teece (2001), and for this reason, requires efforts of managing knowledge by the organization in terms of an asset. From a practical perspective, Alavi and Leidner (2001) comprehend knowledge management as a central function to improvement and innovation that support organisations to compete. Empson (2001) also lifts that the trend of the resource-based view (RBV) has promoted knowledge and increased its popularity as a competitive advantage. Additionally, it is highlighted by Empson (2001) how the advancement of information technology has created new incentives for identifying knowledge and in turn creates systems or processes as effective means to distribute knowledge throughout organizations and to its employees.

Furthermore, in an alternative context, knowledge can also be comprehended as organisational or personal (Dulipovici & Baskerville, 2007). As stated by Tsoukas and Vladimirou (2001, p. 979), personal knowledge is “[...] the individual capacity to draw distinctions, within a domain of action, based on an appreciation of context or theory, or both”. On the other hand, organisational knowledge is “[...] the capacity members of an organisation have developed to draw distinctions in the process of carrying out their work, in particular concrete contexts, by enacting sets of generalisations whose application depends on historically evolved collective understandings” (Tsoukas & Vladimirou, 2001, p. 973).

In organisations, knowledge can also be understood as internal or external (Earl, 2001; Frenz & Jetto-Gillies, 2009; Menon & Pfeffer, 2003). Internal knowledge is acquired from

internal sources such as: HR and R&D departments, sales department, production floor, and employees (Earl, 2001). External knowledge is acquired from external bodies such as: customers, experts, suppliers, consultants, other organisations, and industrial cluster(s) (Frenz & Ietto-Gillies, 2009; Lopez-Sáez et al., 2010).

In this sense, the knowledge base of an organisation cannot merely be characterized as formal knowledge that originates from learning and development programmes, contexts, interactions with customers, suppliers, and clusters or formal information. It is also informal, tacit, and taken for granted (Tsoukas & Vladimirou, 2001; Garvey & Williamson, 2002). Garvey and Williamson (2002) depict that should there be trust, commitment, respect and loyalty between employees in an organization, then informal knowledge can be advanced and shared. Consequently, Tsoukas and Vladimirou (2001) underpin the notion that organizations should support social communities to build up these ethics.

Explicit knowledge is described as a tangible concept which can be recorded, detailed, authenticated and distributed to other forms such as procedures, reports, strategies, guidelines and databases (Nonaka & Konno, 1998). Explicit knowledge is accumulated, deposited, and articulated in indubitable media (Greiner, M., Böhmman, T. & Krcmar, H, 2007). This apprehension proposes that explicit knowledge can be transferred through more technology-driven and structured processes such as information systems (Mårtensson, 2000). In a nutshell, Laudon and Laudon (2004, p. 316) underpin that, “Informal internal knowledge, often called tacit knowledge, resides in the minds of the individual employees but has not been documented in structured form”, but “[...] structured internal knowledge is often called explicit knowledge, such as product manuals or research reports.” Further elaborations are made by Hislop (2013) and Nonaka and Takeuchi, (1995) that explicit knowledge is, on the contrary, easier to codify because it does not have the same inherent characteristics as tacit knowledge and is consequently easier to share. As discussed, both tacit and explicit knowledge have distinctive views on how feasible it is to integrate the two forms of knowledge in organizations and are not the only ways the notion of knowledge can be presented and comprehended. Objective and process-based knowledge are two perspectives that are highly discussed and used in defining processes of knowledge sharing. (Nonaka, Toyama & Hirata, 2000; Hislop, 2013). Within the objectivist perspective there exist a theory called “knowledge-based theory of the firm” (Hislop, 2013). Characteristics of this theory are transferability (of knowledge), capacity for aggregation (and in particular absorptive capacity) and appropriability (to create value equal to the invested time in transferring and making use of pieces of knowledge) amongst others (Grant, 1996). Although the theory is used within the objectivist perspective on knowledge,

appreciation of tacit knowledge and knowledge inherent to individuals are stressed by the author.

To concise, this section highlights knowledge from the organizational perspective which aims to affirm individual knowledge to be admitted to the knowledge network of the organisation (Nonaka & Takeuchi, 1995). Theoretically, Gherardi (2006) and Wallace (2007) argue that knowledge often becomes embedded in organisational artefacts such as documents and databases and also in wider organisational processes and practices. In order to accumulate all the benefit from its comprehensive store of knowledge, an organisation should consider all of the aforementioned knowledge sources as complementary (Johnson, B., Lorenz, E. & Lundvall, B., 2002). However, knowledge also needs to be apprehended as ambiguous and highly variable and to highlight a variety of emphases and themes (Laudon & Laudon, 2004; Nonaka & Konno, 1998; Tsoukas & Vladimirou, 2001). Due to this alterability, combining and transferring knowledge is likely to be a complex process and subject to many constraints (Earl, 2001). Also, tacit knowledge is an essential component to underpin organizational success and tacit knowledge sharing contributes directly to enhancing knowledge creation and to obtain a competitive advantage in the business environment (Kruger & Snyman, 2007). The willingness to share knowledge may be challenged by different organisational structures and cultures and may need to be assisted by certain knowledge strategies, efforts and learning endeavours from management (Petrescu, Popescu & Sirbu, 2010). Subsequently, we can determine the vast work practices connected to knowledge and therefore aim to examine how it could be connected to innovation.

2.3 The relationship between knowledge and innovation

Many academic authors suggest that the innovation process involves the transformation of valuable knowledge into added value for the organisation (Merx-Chermin & Nijhof, 2005; Drucker, 1993). Also, previous research on innovation underpins the relationship between KM and innovation (Cohen & Levinthal, 1990; Darroch & McNaughton, 2002). Hargadon and Sutton (1997) imply that the actual transfer of knowledge between individuals and groups is vital for solving problems. The authors further observed that when knowledge is transferred among groups within the organisation, existing ideas from one group could appear novel to another, and vice versa, resulting in potential new products or services. Generally, according to Kamasak & Bulutlar, (2010), constant collection and integration of new knowledge will lead to innovativeness.

In relation to knowledge management, Seidler-de Alwis and Hartmann (2008), suggested that KM influences all innovation stages. The whole innovation process is a series of learning cycles where KM activities, such as sharing lessons learned, could potentially push thinking beyond daily tasks in a sense that spurs and stimulates innovative creativity. Overall, ideas are generated through the combination or formation of theoretical and practical knowledge. An effective knowledge codification method means learning from past experience and improves the development of new products/processes (Seidler-de Alwis & Hartmann, 2008; Ruggles & Little, 1997). According to Ruggles and Little (1997), preparation is essential to examine how ideas fit in with the existing elements of an organisation and affect the implementation stage of KM. If the new product or process does not meet the needs of customers, neither marketing or implementation will be successful. Success or failure can sometimes be traced back to the preliminary market research and the acquisition of in-depth knowledge of users, as well as the subsequent customer relationship management (Easa, 2012). According to Seidler-de Alwis and Hartmann, (2008), the learning stage of innovation is a measure of the scope of impact of the implemented idea and translates into the total value achieved from the innovation. Also, the authors suggest that it takes the form of internal knowledge transfer in terms of how well new methods are working and how they can be utilised within the organisation. It can happen formally and informally, so sharing knowledge through seminars, technical forums, segment meetings, conferences, clusters, and training programmes supports to spread and expand innovations. Finally, Swan and Newell (2000), comprehended that knowledge acquisition through external networks, suppliers, customers, and clusters keep organisations aware of new developments, which in return assist them to invent and create new sustainable products/services. They also pointed out that the creation of knowledge through social communities builds new knowledge management procedures, which in turn backs the selection and implementation processes of new, innovative products/services. The detailed apprehension and storage of knowledge can be used as a means of learning how to utilise innovations more effectively.

2.4 The learning organization and knowledge culture

The learning organization is said to consist of individual and group learning through organizational structures, databases, routines etc. (Crossan et al., 1999; Hislop, 2013; Engström & Käkelä, 2019). Additionally, it could be argued that organizations rely on a culture that promotes knowledge management (Oliver & Kandadi, 2006). Furthermore, the learning

organization as such is connected to the concepts of open innovation, collaboration and knowledge sharing according to Cheng et al. (2019). However, the notion of the so-called learning organization is strongly connected to the organizational learning model by Crossan et al. (1999), which is popularized through a number of other authors (Hislop, 2013; Deschamps & Mattijs, 2018). According to Crossan et al. (1999), the model explains the relationship between the individual, group and organizational level with two concepts, feedback and feedforward. Additionally, the four concepts: intuiting, interpreting, integrating and institutionalizing are used to explain the learning curve from an individual level to an organizational level (Crossan et al., 1999). Crossan et al. (1999) also state that aspects such as multi-levels and different levels affecting each other are connected to the SECI model by Nonaka (1994). However, the difference is that the Crossan et al. model considers feedback and feedforward in the learning process as a tension of renewal to support continuity as well as the application of both new and existing knowledge (Crossan et al., 1999; Hislop, 2013).

Nevertheless, connections between the works of Crossan et al. (1999) and Nonaka and Takeuchi (1995), are solicited by Brix (2017), by connecting knowledge creation via the SECI model with organizational learning and concepts such as multiple levels of knowledge. The purpose of the authors' paper is to build a framework to show how the levels influence, stimulate and create new knowledge for strategic renewal (Brix, 2017). An alternative study uses the analogy of levels and is comprehended by Engström and Käkelä (2019) where the authors connect levels of difficulty of work tasks to the possibility of creating processes, where creative learning is the outcome. In other words, in cases where existing knowledge is questioned and reflected upon also generates new forms of knowledge (Engström & Käkelä, 2019). Furthermore, the notion on the learning organization by Engström and Käkelä (2019), can also be found in the work of Jonsson (2013). A common denominator in both works is how the learning organization empowers and adds flexibility to employees' work in order to utilize, renew and test existing knowledge in various new ways.

According to several researchers, (De Laat & Broer, 2004; Jagasia, Baul, & Mallik, 2015), practice and academia view knowledge management as an acceptable method fostering the organization's capability to respond sufficiently to recognized and important changes of the organizational environment. Thus, organizations need to be able to create an environment that encourages knowledge sharing. The necessary processes are the methods to acquire, create, organise, share and transfer knowledge (Easterby-Smith & Prieto, 2008; Kruger & Snyman, 2007; Nonaka & Konno, 1998). Consequently, according to Swan et al. (1999), organisations have to:

- Encourage continuous learning in order to foster knowledge sharing.
- Document and collect best practices and lessons learned to facilitate knowledge use and transfer.
- Perform knowledge audits to identify certain fields where further knowledge is needed.

In a study by Oliver and Kandadi (2006) communities of practice (CoPs) as a contributor to knowledge, cultures are highlighted as it enables like-minded people to solve similar problems and to strengthen the view of knowledge cultures within communities. The idea behind communities of practice could be more amply clarified as networks that share topic-related knowledge with one another (Wenger, 1998; Borzillo & Kaminska-Labbé, 2011). The communities also have common activities; therefore, they possess common knowledge, a common identity and various overlapping values (Hislop, 2013). It is certainly evident that communities of practice are heavily represented in the literature on knowledge management. According to a great deal of authors, communities of practice enables and furthers knowledge sharing (Wenger, 1998; Wenger & Snyder, 2000; Hislop, 2013). Even though the concept is promoted as an exceedingly effective tool for new product development and knowledge sharing, it is fundamental for the community to be able to sustain itself (Wenger & Snyder, 2000). This means that trying to manage or control the communities is rarely beneficial since the communities are created in consensus by members and not by managers whom most often create teams rather than communities (Wenger & Snyder, 2000; Hislop, 2013). The difference between a project team and a community of practice lies within the purpose where a community serves to share knowledge and develop its members' capabilities, whereas a project group most often aims to deliver a product or service (Wenger & Snyder, 2000). Furthermore, the communities are often promoted due to their abilities for quick problem solving, creating better practices (for organizations), developing professional skills as well as retaining talent since the community helped to find the best fit for employees within the company (Wenger & Snyder, 2000). Although the communities of practice are autonomous they still require to be structured on legitimacy and to be integrated into the organization in order to have authentic effects that can benefit the company (Wenger & Snyder, 2000; Oliver & Kandadi, 2006; Al-Alawi, Al-Marzooqi & Mohammed, 2007). According to Wenger and Snyder (2000), when knowledge is circumvented within the community it also creates renewal, subsequently creating new valuable knowledge.

As this chapter has explained the learning organization and knowledge culture, the purpose has been to introduce the reader to the interconnectedness between organizational implementations and knowledge initiatives. Secondly, it is important to highlight how

phenomenon such as communities of practice can be understood in the context of a learning organization and knowledge culture. However, the next chapter will take a departure from looking only into the organization and focus outward towards its surroundings.

2.5 Clusters and external sources of knowledge

Almost 100-years ago, Marshall (1920) claimed that industrial clusters contain the function of the local labour market, suppliers serving specific demands, and the technology spillover. It is easy for companies in an industrial cluster to employ knowledgeable staff with a specific skill set and procure specific goods. Therefore, when the companies enter the cluster, they can employ skilful staff and obtain knowledge because of the function of technology spillover (Marshall, 1920). Based on Marshall's position, Krugman (1991) discussed the birth and growth processes of industrial clusters such as the carpet industry in the United States and the apparel industry in Milan. In addition, Krugman (1991) asserted that companies in the apparel industry within said industrial cluster would have access to information about trends. From the viewpoint of competitiveness of industrial clusters, Porter (1998) referred to the accessibility of technical and market information. Due to geographical proximity, companies in a cluster can easily obtain information according to the author. Furthermore, cooperation between delivery and marketing in the cluster leads to greater effectiveness (Porter, 1998).

However, in more recent times the field has transitioned into newer departures where the focus lies on clusters of innovation or knowledge networks and what effect they have on companies' innovative capabilities (Della Peruta et al., 2016; Volgmann & Münter, 2018; Wang & Zhang, 2019). Even national projects such as the Danish Innovation Network Program has tried to increase the productivity for Danish companies by creating networks where research and knowledge can be shared (Daly, 2016). In contrast, Swedish funding for collaborative endeavours such as the Danish example can be seen through the very same initiative here in the region of Skåne (Skåne, 2016). The two examples show a regional as well as a national level of interest for innovation which confirms the large interest for innovation networks. Furthermore, the reports on cluster theory from Daly (2016) and Skåne (2016) focus on regional and metropolitan developments in relation to globalization, and increasingly greater market pressures on organizations and their need to utilize knowledge in order to stay competitive. Innovation has in this sense been integrated with knowledge and according to Della Peruta et al. (2016), to the learning abilities and competence of companies. The authors stress the importance of companies operating in these regions to take advantage of collective

efforts since they affected not only by costs but also from competition, innovation and institutional change that shapes their environment.

Followingly, the knowledge found from these environments could de facto be understood as external knowledge since it is drawn not from the organization itself but from its surroundings. Thus, external knowledge from collaborating with suppliers and universities (Santoro, Vrontis & Pastore, 2017) as well as from network connectivity (Trantopoulos et al., 2017) can aid organizations in their aspiration for innovative success.

Subsequently, these newer departures will be used in the effort to explain how cluster theory can play a role for companies when trying to utilize knowledge found in its outside environment. The combination of what has previously been said about internal knowledge and this chapters focus on external knowledge will end in the theory of knowledge integration where we will combine the two different types of knowledge.

2.6 Knowledge Integration

Another field that considers the importance of external knowledge and the relevancy to look outside the company and into the knowledge environment is knowledge integration. Highlighted as an understudied field by Berggren et al. (2011) the authors point to its interjection and influence on different hierarchical levels in organizations. The authors also present a model explaining how they, in relation to existing research in the field, see knowledge integration as a process.

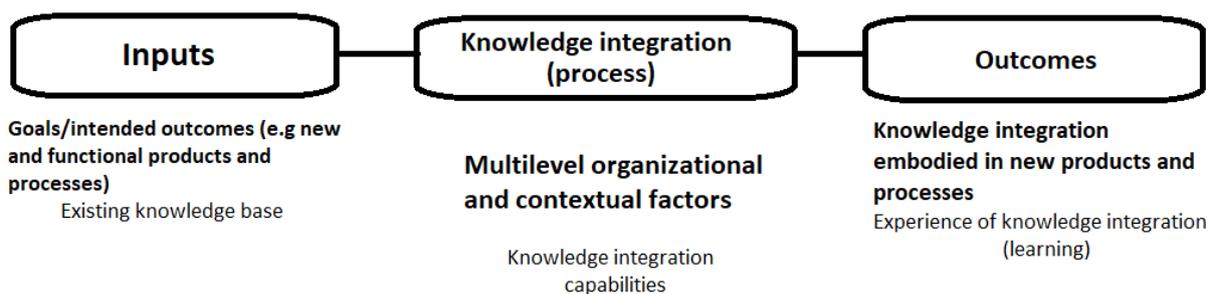


Figure 1 A simple model of knowledge integration. Adapted from: (Berggren et al., 2011, p. 8)

As Berggren et al. (2011) also present a view based on a process, much like the SECI model, this model will be used to better understand how external knowledge can affect the internal knowledge process when creating new ideas. By utilizing this model, the primary outcome is also to identify the overall success (or non-success) of several impacting factors

determining whether it is an innovative product or not (Berggren et al., 2011). Furthermore, these determinants are also rooted in organizational experience, learning and the building of knowledge integration capabilities (Berggren et al., 2011). Thus, the authors view on knowledge integration could be related to this thesis previous theoretical subchapters on processes where existing knowledge is being utilized (socialization in the SECI model), organizational learning as well as from the external environment (clusters and external knowledge sources). However, not only are organizations facing to recognize these factors but in more recent departures on knowledge integration factors such as managerial and professional logics as well (Ollila, Styhre & Werr, 2015). Ollila, Styhre and Werr (2015) focus their research on the interplay between the two logics where professionals need autonomy in their work but also the importance of bringing the professionals to work together in order to solve client problems according to the professional logic. In contrast, the managerial logic is connected to managerial oversight and systems or procedures connected to knowledge management systems (Ollila, Styhre & Werr, 2015). Furthermore, the result of the study shows how the professional logic created incentives from professionals to further develop their understanding of their own field whilst the managerial logic enabled this need by building networks and creating incentives to seek and share new knowledge (Ollila, Styhre & Werr, 2015).

Thus, if we deduce that further developing the professional's knowledge is a fundamental aspect, it could therefore also connect to the breadth and depth of knowledge a firm has. As Zhang and Xu (2019) try to identify several factors and whether or not they have an effect on marketing dynamic capabilities, the authors look at the breadth and depth of knowledge and its effects on these capabilities. What the study unveils is what effect knowledge breadth and knowledge depth have on company's capability of integrating knowledge (Zhang & Xu, 2019). In the same study, the authors posit how companies that can learn from consumer markets and industry knowledge and to consequently add them can build a broader and deeper knowledge through knowledge integration (Zhang & Xu, 2019). Arguably a connection can be established between professional knowledge development, managerial logics and the knowledge capabilities of the organization.

Another angle on knowledge integration is connected to project-based organizations (Takhtravanchi & Pathirage, 2018; Prieto-Pastor, Martín-Pérez & Martín-Cruz, 2018). Although both studies examine different cases they both accentuate the importance of knowledge integration as an important tool to assimilate and save combinations of knowledge that have been combined during a project. In the article of Takhtravanchi and Pathirage (2018) the authors underscore how employees were not aware of the importance of sharing their

knowledge or transferring it to other projects, meaning no real process for knowledge integration was in place by the organization. However, Prieto-Pastor, Martín-Pérez and Martín-Cruz (2018) show that two dimensions of social capital, shared vision and social interactions ties showed a significant effect for organizations in the sense that they played an important role in steering employees understanding of knowledge integration. As both articles stress the necessity of creating understanding within the organization of knowledge integration and its positive effects, it shows a connection to the two previous sources. Firstly, it can help to create both breadth and depth in the “knowledge reservoir” of organizations by creating awareness amongst employees to absorb relevant knowledge when working with partners for learning purposes. Secondly, the different determinants addressed by Takhtavanchi and Pathirage (2018) and Prieto-Pastor, Martín-Pérez and Martín-Cruz (2018) are closely connected to the different approaches within knowledge integration as seen in the works of Berggren et al. (2011). The approaches within knowledge integration rely upon sharing or transferring knowledge, the use of similar or related knowledge but also on the combination of specialized, differentiated and complementary knowledge (Tell in Berggren et al., 2011). However, the authors point to the first and third aspects being taken into use when defining knowledge integration but also to the accompanying critique. The first aspect is criticised by pointing to how transferring knowledge is by no means necessarily an efficient way to integrating knowledge. Additionally, critique towards the third argues that specialized knowledge is hard to integrate or not even possible at all due to a lack of common knowledge (Tell in Berggren et al., 2011). Nevertheless, by pointing to the need for systems that can create shared views on understanding the need for knowledge integration, it could also possibly create systematic tools for the first and third knowledge integration aspect. Thus, knowledge integration can tell us how different types of knowledge, whether it is a combination of internal or external sources, is largely dependent on shared interpretations and social interactions ties as well as learning capabilities through broad and deep knowledge. These key areas can, therefore, be understood through socialization, the learning organization and from external sources and consequently by comprehending the premise of the theoretical areas prior to knowledge integration.

By going back to the presented model by Berggren et al. (2011) we can, therefore, determine that intended outcomes as inputs can be better understood via shared interpretations or social interactional ties. These factors can, in turn, organize more coherent interpretations of what kind of knowledge is needed. Secondly, as knowledge integration capabilities are determined by the internal and external knowledge sources, organizations with deep and broad knowledge could possibly find better sources of knowledge, thus adding quality to the process

of knowledge integration. As sources of knowledge are said to contribute to the knowledge integration process it is equally important to understand how the process shape the knowledge. Thus, an exposition on the SECI model ends the theoretical presentation.

2.7 The SECI model

As the book “True Partnership as true learning” by Jonsson (2013) affected this study, it inspired us to delve into the broad field of knowledge and the process of knowledge sharing. According to Ahmadjian (2004), knowledge creation occurs not only within firms but also through relationships between firms. Additionally, knowledge creation also occurs through relationships between industrial clusters (Maskell 2001). The aforementioned remarks by Ahmadjian and Maskell illuminate two different contexts in which knowledge sharing is taking place. Consequently, this understanding sparked an interest in the SECI model (Nonaka & Takeuchi, 1995) and how it can be adopted in the aim of discovering how knowledge is being both shared and generated.

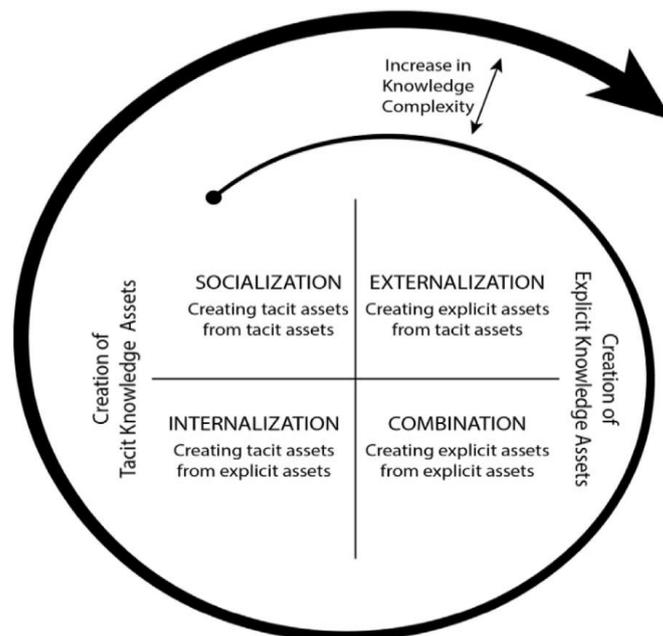


Figure 2 SECI Model of Dynamic Knowledge Creation. Adapted from: (Nonaka, 1994)

Bose (2004) comprehends six steps which represent the cyclical model of KM processes: creating knowledge, capturing knowledge, refining knowledge, storing/codifying knowledge, keeping knowledge updated and disseminating knowledge. Consequently, Hansen, M.T., Nohria, N. and Tierney, T. (1999) summarised these processes into two key strategies: a

codification strategy, which essentially intends to store and systematise the knowledge of an organization and make it available to every employee; and secondly the personalisation strategy which intends to aid the flow of individuals' knowledge in an organization.

The SECI model is a knowledge creation model through the chain process of Socialization, Externalization, Combination, and Internalization (Hislop, 2013; Bandera et al., 2017). Furthermore, it is also stated by Hislop (2013) that the model itself involves many aspects such as leadership and management, different organizational structures as well as business strategy. To simplify, the SECI model will provide a clear view of where and what is happening in the knowledge creation/sharing process within the chosen case company.

The very basis of the SECI model stems from the works of Nonaka (1994), Nonaka and Takeuchi (1995), Nonaka and Konno (1998), Nonaka and Von Krogh (2009) to mention a few and is derived from Nonaka's belief that we live in a knowledge society and from the innovative work in "contemporary organizations". The author also points to the previous view on the process of information as "the solution lies in the 'input-process-output' sequence of hierarchical information processing" and how this is problematic (Nonaka, 1994, p. 4). Nonaka (1994) further explains how this point of view perceives information as a problem-solving endeavour which stems from a static and passive view of the organization. Furthermore, the SECI model is based on the assumption that knowledge is inherent to individuals and is therefore tacit (Nonaka, 1994). According to the author, the idea of the tacit dimension within this framework is based on the belief that knowledge goes through a process of "justification" - meaning knowledge has to be accepted by others in order to be valid. Although Nonaka emphasises the tacit dimension through the works of Polanyi (1966; 1983), the author adopts a stance within the traditional epistemology of knowledge where knowledge is focused on truthfulness. This is in contrast with the justification of knowledge which is based on a personal belief in the nature of knowledge (Nonaka, 1994).

However, the importance of the SECI model lies within the four domains of socialization, externalization, combination and internalization (Nonaka, 1994; Nonaka & Takeuchi, 1995; Gourlay, 2006; Hislop, 2013; Bandera et al., 2017).

As illustrated by Figure 2, the process involves four stages in which tacit knowledge is successfully (or unsuccessfully if we take the complexity of the boundary spanning knowledge management into consideration) turned into explicit knowledge. Nonaka (1994), explains how tacit knowledge is amplified and enriched through the process from the individual level to the organizational level. An additional layer of complexity is also added as the knowledge progresses through the process (Nonaka & Takeuchi, 1995). The process itself starts with interactions

between individuals where tacit knowledge is transferred via shared experiences (Nonaka, 1994; Nonaka & Takeuchi, 1995). In the second stage, different types of knowledge are combined to create an explicit picture of the tacit knowledge in the process. This is “triggered by successive rounds of meaningful “dialogue” (p. 20) which is based on successful enabling of socialization within an organization (Nonaka, 1994). The third and fourth steps are the utilization and combination of the explicit knowledge in order to make it available to all organizational members who can, in turn, create their own meaning in the newfound knowledge from the process (Nonaka, 1994). It is argued that this process closely resembles the same perspective on knowledge creation adopted in the value creation process of knowledge as mentioned above. By enabling tacit knowledge to evolve into explicit knowledge through the process in the SECI model, it can subsequently create value for the organization as a whole (Nonaka and Von Krogh, 2009). In a more recent article by Nonaka and Von Krogh (2009), it is explained how knowledge conversion - the interconnectedness of tacit and explicit knowledge, should not be separated from one another. It is rather the tacit knowledge that enables the process of turning it into explicit knowledge according to the authors. The aforementioned article by Nonaka and Von Krogh (2009) is based on a number of questions and articles that criticise the original study by Nonaka (1994). One such critique is focused on how organizations uphold the knowledge sharing and creation process in the SECI model. Due to the fact that the model is based on the notion of “justified true belief” - social practices which in turn is closely related to the endeavour of crystallizing tacit knowledge is present (Nonaka, 1994). Nonaka & Von Krogh (2009, p. 644) respond to this critique with, “By being a member of a social practice, practitioners learn the “rules” of performance, skills, values, beliefs, and norms that constitute virtuous behaviour and that shape their work.” Also, they add that “The social practice’s boundaries and member inclusion are part of defining a social identity. Practitioners tend to draw “boundaries” around their social practice, and they regulate “membership.” (p. 644). These comments can be connected to the idea of managing communicative boundaries where managers and leaders facilitate this process (Carlile, 2004). Just as the boundary spanning process of knowledge management needs managing (Carlile, 2004), so does the knowledge creation process (Hislop, 2013). Although other critique points to conceptual difficulties such as Nonaka only providing brief or anecdotal points to his work (Gourlay, 2006), the foundation of the model is still fundamental to be considered by other apprehensions within the field of knowledge management.

2.8 Summary of the theoretical background

After a firm grasp of the conceptualization of innovation and knowledge, the relationship between knowledge and innovation has been thoroughly examined in the theoretical section. However, no recent research attempted to explore this relationship in primarily manufacturing (packaging) and system & service providing organization such as Tetra Pak (in Lund, Sweden). From the literatures reviewed and apprehended, knowledge sharing is viewed by most companies as one of the most significant issues in knowledge management. Therefore, further research needs to be conducted in order to uncover how knowledge sharing and integration contribute to innovation and to understand the urgency behind finding relevant knowledge in order to remain a market leader in the food and beverage packaging industry.

As knowledge is becoming increasingly more important, it is up to organizations to have effective means and tools to work with knowledge and uncover its potential. This could be understood by companies who attempt to comprehend the connection between knowledge and innovation and how to form workplaces with a focus on adopting the notion of a learning organization which focus on the importance of knowledge culture. In this regard, it is fundamental for organizations to work with both individuals and groups as well as with concepts such as feedforward and feedback (Crossan et al., 1999). Also, the concept of communities of practice is a potential form of network which can bring great value to the work with knowledge due to its ability to create an environment of belonging and consequently socialization for employees to share experiences etc. (Wenger, 1998; Oliver & Kandadi, 2006; Borzillo & Kaminska-Labbé, 2011).

However, organizations also need to look outward to find external knowledge. By operating in cluster environments with close geographical proximity, organizations can take part in gaining technical and market information (Porter, 1998). Although, today organizations operate more often in what are called clusters of innovation or knowledge networks (Della Peruta et al., 2016; Volgmann & Münter, 2018; Wang & Zhang, 2019). It is further stressed how companies operating in proximity of these clusters or networks have the ability to take part of collective efforts which can bring enhanced learning abilities and increase company competence (Della Peruta et al., 2016).

By acknowledging the learning organization and how to work with internal knowledge as well as the clusters of innovation and knowledge networks, the reader might realize that there comes a point where both sources of knowledge need integration. Alas, a deployment of

knowledge integration is needed and can by Berggren et al. (2011) be seen as a process. Furthermore, the reader should remember the basis of knowledge integration which rests upon three principles according to Tell in Berggren et al. (2011). These are, the sharing or transferring knowledge, the use of interchangeable or related knowledge and lastly on the combination of differentiated, complementary and specialized knowledge (Tell in Berggren et al., 2011). Thus, a connection can be established between knowledge integration and the SECI. In relation to the SECI model and innovation, studies that employed knowledge integrative processes for innovation suggested “across the board” that the SECI processes together intensely underpin innovation (Easa, 2012). Applying the SECI model as a tool for examining knowledge sharing and integration would require the authors of this thesis to look at the culture of the researched company in the analysis section (section four), and in particular, to identify any signs of a learning organization or a culture focused on knowledge. The usability of this model in this context should be highlighted as it recognises that knowledge integration, sharing and using knowledge, are fundamentally social activities that are embedded in a network of cultural norms and human relationships.

Lastly, it is worth to point out that in today’s global environment where knowledge has to cross national boundaries, there is an urgent need for extensive knowledge capabilities in a context which consequently leads to more instances of knowledge integration where internal knowledge is combined with the available external knowledge.

3 Methodology

The following section will provide the reader with clarification regarding the chosen methodology and to argue for its relevance. The methodology will also explain the analytical tools used in the process of gathering empirical material as well as the research design and research process as a whole. Ultimately, the section will end in a reflection of our methodological design as well as point out some limitations to provide a thorough perception and a reflexive notion on the paper itself.

3.1 Theoretical grounding

As this paper explores the contextual situation at Tetra Pak with notions of social interactions and constant exchange of various ideas and knowledge, the paper will use an interpretive approach. This approach will allow the researchers to more deeply understand how the social world within Tetra Pak is constructed. According to several prominent figures in the field of interpretivism, the idea of the social world is created through how individuals order, classify, structure and interpret it and consequently act based on these ideas (Prasad, 2018). Also, accentuated by Prasad (2018) is how conducting interviews in the research process is most often associated with symbolic interactionism.

However, Prasad (2018) also presents the hermeneutic tradition which also adopts an interpretive approach but more so when interpreting texts. Since this paper also intends to analyse a survey conducted within Tetra Pak, hermeneutics became a powerful tool to interpret the different meanings from the surveys of several participants. In this context, the focus was not on the authors' use of language but instead on the answers from the respondents. Additionally, certain traditions in the interpretivist tradition tells the authors how cultural contexts can create ideas on how to perceive certain things. Based on the interpretive tradition and its importance to understand social constructions in the social world, this paper has therefore taken its methodological standpoint in the two traditions, symbolic interactionism and hermeneutics. These two traditions attempted to create a better understanding – or as Weber (Weber, 1949 in Prasad, 2018) calls it, *verstehen*, where we attempted to make sense of a phenomenon. This further led us to apply this “interpretive lens” as we tried to analyse and make sense of the conveyed messages and meanings by the interviewees in this paper. Since most of the interviewees are employees at Tetra Pak at various hierarchical levels it created an opportunity for us to apply symbolic interactionism by considering what is explained as “sense

making” (Prasad, 2018). By interviewing both managers, specialists and directors alike, sense making played a key role in understanding how sensemaking were created at various levels in relation to the company’s strategy and operations on innovation and knowledge. Mead (1977 in Prasad, 2018) points to the importance of how seeing oneself objectively in social situations is imperative in understanding the process of sensemaking and consequently the creation of individuals own reality. However, the author does mention the interconnectedness between the view society has on individuals and individuals own perception of themselves as being a mutual construction where the individual learns to reflect upon their own actions. Thus, the tradition of symbolic interactionism provided clarity to the paper through its use of identifying the meaning given to the concepts, innovation and knowledge sharing by the interviewees. The authors of this paper believed this would add extra empirical material that could help to bring forth a better picture of the sense making of innovation and knowledge sharing within the case company. Although, the researchers also needed to be aware of its source material and to be ready to critique it. It is stated by Schaefer and Alvesson (2017) that researchers need to be aware of the inherent risks when relying heavily on interview statements. These risks originated from the misuse of certain sources as “authorities” according to the authors. The researchers should not take all statements as universal facts but rather be critical towards their most often subjective nature (Schaefer & Alvesson, 2017). Consequently, the use of hermeneutics provided a critical point of view by comparing the statements in the survey with statements from the interviewees.

3.2 Research design and process

Since the word “methodology” stems from ancient Greek and contains the word “hod” as in hodos, which translates to road in English (Styhre, 2013), methodology could be presented as a journey. For this purpose, the methodology and research design are part of a research process and should be thoroughly presented as it provides hints to how the empirical material is gathered and furthermore, analysed by the authors of this thesis. According to Davis (1971, 1981, in Alvesson & Sandberg, 2011), a theory becomes noticeable or even famous, not only due to its truthfulness but also if it succeeds in challenging underlying assumptions in an existing theory. In order to create a sense of meaning it cannot be connected to “gap-spotting” simply because when doing so, the researchers automatically accept underlying assumptions and rather reinforce instead of challenge existing theories in the process (Alvesson & Sandberg, 2011). According to the authors, gap-spotting is used extensively within academic research and

primarily within qualitative-inductive research. Consequently, the authors of this paper aimed to apply the remarks of Alvesson and Sandberg into this academic research due to the pure interest of further understanding the field through this paper's aim. Meaning that knowledge management as a field which has already been thoroughly researched needed to be looked at from new type of "academic lens". By adding a new "lens", this study wanted to further comprehend how companies operating in cluster environments integrate external knowledge to strengthen their innovative and competitive capabilities. Furthermore, the authors strived to follow the proposed process "The Research Process: Decision Tree for Mystery-Focused Research", presented in Alvesson and Kärreman (p. 1271, 2007) - where we hoped to find a mystery by combining two theoretical fields closely related to the case context. While the authors wanted (and still want) to be humble in their endeavour, the aforementioned theoretical frameworks in relation to the case study was analysed, criticised and questioned which in turn did support a case of "mystery" as proposed by Alvesson and Kärreman (2007). The mystery itself did appear as the authors of this paper found how various theoretical ideas and empirical data could be combined in this thesis in a way they felt was unique.

Moreover, as seen through various highlights in the theoretical framework of this thesis, the field of knowledge management can be understood as very extensive with a myriad of different theoretical views. Arguably, one reason could be that the field is rooted in subjectivity, through its close relation to social sciences which is highly subjective and not a positivist field. Since this study aims to comprehend the role knowledge plays in the process of integrating the internal knowledge within Tetra Pak with the external knowledge that can be found in the surrounding cluster initiatives - interviews and survey material via an interpretive methodology provided the foundation for the empirical data collection in this study. Also, as the applied research design aimed to follow the interpretive tradition and use of a qualitative style, it is therefore imperative to consider the amount of subjectivity in data collection during qualitative studies as pointed out by Styhre (2013). Thus, as mentioned in the previous sub-chapter, it is critical to understand if certain sources could automatically be considered to be true or not in comparison to actual authorities as pointed out by Alvesson and Schaefer (2017). It is claimed by the authors that the objective truth should only be taken for granted when relying on authorities who can present non-questionable facts. It is therefore imperative to consider what is an objective knowledge claim and what is a source that is questionable when conducting interviews. In order to be able to utilize the empirical material, it is therefore important to argue for the empirical excerpts in order to show the relevance of one's own research (Rennstam & Wästerfors, 2018). This is also why conducting observations is a possible way of confirming

certain sources since it takes great consideration to as how and what is happening in a certain context when using an interpretive methodology (Rennstam & Wästerfors, 2018). Exemplified by Prasad (2017) as “qualitative positivism” or “positivist anxiety” many academic texts in social sciences suffer from applying positivist characteristics to the social reality. This notion by the author could subsequently support the claim to adopt a critical analysis towards sources and to not treat empirical data as authorities but rather open for critique and discussion. We have therefore followed the above remarks by the authors to remain as critical as possible towards answers by the interviewees we believed could be questioned in order to create consistency in the thematic parts.

Furthermore, this study has taken an abductive path since the original methodology of this thesis was to adopt a deductive approach which developed into induction after the empirical material had been discussed and sorted by the authors. The sorting and analysis of the empirical material required the authors to rethink some of the theoretical elements and consequently lead to a combination of both deduction and induction. This is a methodology which the authors Alvesson and Sköldböck (2018) mention is used when working openly with theoretical concepts and empirical material which brings the researcher back and forth between the theoretical framework and the empirical data.

Additionally, this has led to the implementation of an explorative approach since the aim has been to investigate this thesis problematization which focuses on sharing and integrating knowledge in a context of cluster theory and external knowledge for furthering innovation capabilities. Thus, it has been our belief that this area has not yet been thoroughly examined and therefore leads to an explorative style.

3.2.1 Tetra Pak case - a case study

First of all, in order to inquire our interest, we decided to conduct a single, holistic case study at Tetra Pak. The authors' aspiration with this case study was to explore and comprehend the contemporary phenomenon of what role knowledge plays in the process of integrating the internal knowledge with the external knowledge that can be found in the surrounding cluster environments. Hence, it is indispensable for us to dive into the topic in order to establish a firm apprehension of this phenomenon. As Eisenhart and Graebert (2007) depicted, a case study allows the authors to gain a broad and comprehensive understanding of the context and practices in which their case company is embedded. The site chosen for this academic research is Tetra Pak in Lund with ties to cluster initiatives in the Skåne region. The research design via

a case study within this setting is meant to answer the questions of “what”, “why” and “how” as being the inherent characteristics of a case study (Saunders et al., 2002). In this particular case, it signifies that the authors were intrigued in apprehending what the case company does by understanding *how* knowledge sharing and knowledge integration can be combined and understood at a leading multinational company as Tetra Pak to create company innovations.

Tetra Pak is a multinational food processing and packaging sub-company of Tetra Laval, with head offices in Lausanne, Switzerland and Lund, Sweden (Web.archive.org, 2019). The Tetra Laval Group comprises of three industry groups, Sidel, DeLaval and Tetra Pak, all concentrated on technologies for the most effective production, packaging and distribution of food (Tetralaval.com, 2019). Tetra Pak is at the moment the largest food packaging company in the world by sales, operating in more than 160 countries and with over 24,800 employees. The Royal Swedish Academy of Engineering Sciences called the Tetra Pak packaging system one of Sweden's most successful inventions of all time (Tetra Pak, 2019/a). Moreover, Tetra Pak's motto “Protects what’s good” reflects the philosophy upon which the company conducts its business in order to make food available and safe everywhere (Tetra Pak, 2019/a). Nowadays, Tetra Pak offers much more than just packaging equipment for liquid food products. The company supplies complete systems for packaging, processing, and distribution, designed to optimise the use of resources (Tetra Pak, 2019/a). Consequently, Tetra Pak claims they are committed to reduce the environmental impact of their operations and to enhancing the environmental performance of their products and solutions, including the continued development of environmentally efficient packages that protect food and prevent it from being wasted. Consequently, we dispute that the company is a very intriguing research object for their research interest as the company is currently in the midst of an organizational change. Tetra Pak is currently facing the urgency to adopt a new agile way of working to face the presence of competitors in the market where Tetra Pak was the only player, not a long ago (Web.archive.org, 2019; Tetra Pak, 2019/a).

Furthermore, innovation argued to be fundamental for the company as it means transforming knowledge into new products and services into new processes and new working methods. Striving for renewal, or innovation is one of the most important driving forces in the global economy (Tetra Pak, 2019/a). Innovation stimulates competition and affects the organization actual existence. Basically, it increases growth, creates jobs, and mobilises factors that can help nations to advance the competitive strength of its economy. At Tetra Pak, innovation is the result of the total process of developing an idea into a product or a new way of working which adds value to the business (Tetra Pak, 2019/a). Innovation is one of the

mainstays of the organization's survival and growth. Therefore, Tetra Pak aims for innovation due to the following motives: to speed and boost the capacity of its productions, thus serving the ever-increasing demand and continue to count for greater income; secondly, lighter packaging for a better base material usage in relation to packaging and making their packaging products more environmentally friendly (Tetra Pak, 2019/b). Thirdly, digitalization brought along a great number of challenges, which meant opportunities for greater and more efficient outcomes regarding Tetra Pak's end-to-end solutions (Tetra Pak, 2019/b). Also, as a leading multinational organization needs to respond to the ever-increasing external pressures in the 21st century such as climate change; political pressure (bans); the deeming demand of renewability, recyclability and remarkability of its packaging products as well as sustainability. Therefore, Tetra Pak intends to urge for innovation in order to differentiate and grow, secure sustainable business, optimise performance etc. (Tetra Pak, 2019/b).

These underlying notions intensify the search for innovation as the organization's backbone for further growth at all levels. Furthermore, in order to achieve outstanding financial and technical developments through decades, the primary concept of the company's success is innovation. This brought the authors to the fundamental intriguing impulse of this paper as what a multinational and front-runner company has to say about the quest of innovation.

3.2.2 Collection of empirical material

In order to be able to delve deeper into the chosen topic of interest, nine semi-structured interviews have been conducted with current employees on different hierarchical levels throughout Tetra Pak. In addition, one interview with a previous employee who left the company very recently was also carried out. The interviewees were mainly managers and specialists at Tetra Pak but with the addition of one director as well as one "innovation facilitator". These interviewees were chosen due to their relevance to the work with innovation at the company which will be presented further down below in the analysis. With the idea to find opposing views and to problematize the research, several managers and one director were interviewed. Since this paper has adopted a qualitative approach with an interpretive methodology in mind, all interviews have been conducted in a semi-structured way. Semi-structured interviews enable the researchers to ask, without the restrictions found in structured interviews, to explore specific areas but with the possibility to diverge from a questionnaire in order to explore responses in greater detail (Gill et al., 2008; McIntosh & Morse, 2015). Kvale (1996) also addresses semi-structured interviews by introducing it as a research method used

to unearth the life world of the interviewee in relation to interpreting and creating meaning regarding a specific phenomenon. Since the aim of interviews are to explore the social worlds of individuals the importance of allowing interviewees to freely answer a phenomenon has been carefully considered in our methodological approach.

The interviews were all, but one held in a manner of face-to-face in order to make use of nonverbal communication where visual aid can elicit clearer responses from the interviewee (McIntosh & Morse, 2015). Henceforth, face-to-face interactions made it easier for the authors of this paper to prompt the interviewees to further elaborate on specific questions and to understand when to move on in the questionnaire. Further emphasized by Gill et al. (2008) is also the possibility to interview individuals without pressure from group environments. The majority of the interviews except for three were carried out in a closed-off environment. Still, in these three cases, the interviewees had the opportunity to choose where the interviews were held. However, in the case with one of our interviewees at Tetra Pak, we were asked not to record the interview. This can in turn show that even if the individual is alone, thoughts of group pressures or settings where other people can hear the interviewee still has an impact on what is being told during the interview. Out of respect for our interviewee we accepted this request and only took notes with a slower pace during the interview. In interviews there are levels of cooperation where the interviewee ultimately can make the interview successful or for it to fail (Anyan, 2013). For our interviews to provide “sufficient” material, we shifted the power scale that Anyan (2013) talks about meaning the interviewees had full power in every occasion. This was decided based on our pre-assumption that full autonomy for the interviewees would create the most beneficial situation for gathering empirical data. However, the problem that arises from the above request is consequently disadvantages in form of non-replayability (of the interview), biased recounts of what is said, loss of information and lack of reliability (Tessier, 2012). Although taking notes during an interview posed obvious problems, the authors created two roles with one playing the role of a clerk in order to take notes so that the other could ask detailed questions in order to stick to the semi-structured process. Following the interview, the documents were uploaded so that both authors could access and apply their own recounts of the interview.

The phenomenon of unwillingness to fully cooperate could also be coupled to how participants in some cases need to receive validation and support to their experiences in order to be more revealing and forthcoming (Knox & Burkard, 2009). This was taken into greater consideration after one of our interviews where we experienced very short answers which in turn instigated us to both revise the semi-structured questions as well as the overall approach

for the following interviews. Continuously, an interview needs to have understandable and easily-answered questions, but not in the sense of simple “yes” or “no” answers (Gill et al., 2008). With these prerequisites in mind, we aimed to create questions that reflected the respondents’ own position in the company which meant they were adapted to either a managerial role or non-managerial role. This meant that questions for managers were highly based on the idea that managerial work can imply superiority, influence and power of the work of subordinates (Sveningsson & Alvesson, 2016). In contrast, questions for the “non-managers” were not based on the same idea but rather on how their work was influenced by managerial work.

As for the length of the interviews, the aim was to keep interviews to one hour. We believed this would provide enough time for each interviewee to go through the required set of questions the authors deemed to be sufficient for their chosen research topic. This time frame is supported by Loosveldt and Beullens (2013) where a study measuring the interview length for a number of European countries averaged at 60 minutes. However, because of a tight time schedule, the interviewees were in some cases unable to attend the full length of the interview as the authors had hoped. Yet, this did not pose a big hurdle since the interviewees all elaborated on their answers which could root in what Loosveldt and Beullens (2013) highlights is connected to higher levels of education amongst respondents.

As previously stated, this paper also has had the opportunity to gain access to a survey conducted at Tetra Pak on the subject of knowledge management. Since this implies the analysis of text documents, hermeneutics has played an important role in gathering empirical material. Since the underlying purpose of hermeneutics is to clarify and explain what is considered as obscured (Prasad, 2018), the tradition has been used in the sense of clarification. In order to confirm sources as authorities (see Alvesson & Schaefer, 2017) the use of hermeneutics to interpret the survey was used to confirm or problematize certain remarks connected to keywords and key themes in our interviews. Therefore, the survey helped us to unmask what was really being said in thematic areas where the interviewees were not as responsive or revealing as we had hoped.

We would like to bring an end this rundown of the collection of empirical material by stating that we intended to keep all interviews as natural as possible. This meant that all interviews were conducted and based on the needs and wants of comfortability for the respondents as well as on the basis of confidentiality. We felt that respecting these variables enabled the collection to run smoothly and provided an open discussion about chosen topics. It

also helped create a better atmosphere where the respondents were open and forthcoming which we believed led to more elaborative answers.

3.2.3 Analysis of empirical material

The structure of the interviews meant that as stated by McIntosh and Morse (2015), semi-structured interviews cannot provide structured data. This consequently led to the intention to adopt a strategy to sort said material and to compare keywords and key themes simply because of the semi-structured nature connected to the adopted methodology. Rennstam and Wästerfors (2018) highlight the importance of sorting, reducing and arguing for the material. However, because of the elusive nature of semi-structured interviews and followingly, the questionnaires connected to them, we followed a structure to create coherent and more easily followed questions. To a degree, we followed the framework by Chadwick, Bahr and Albrecht (1984, in McIntosh & Morse, 2015) where it is stated that the questionnaire needs to be analysed for traces of enough necessary questions, correct and meaningful language for the respondents as well as a logical order etc. This enabled for a better analytical track to follow when transcribing and locating keywords and key areas for the analysis. The transcriptions of all interviews were divided equally and were done as fast as possible to provoke new ideas for the following interviews. This helped us to create more meaningful questions in relation to the respondents work role, where encounters with new concepts or happenings at the company could be raised in later interviews in order to better understand the answers and consequently the empirical material as a whole. The transcriptions were also a way to protect the material against bias (Gill et al., 2018) where our own interpretation was to a large extent based on the established opinions of the respondents and not on our pre-assumptions of what they actually meant. However, according to Kvale and Brinkmann (2015), in the summarization of the analytical process, analysing the material already begins in the interview where the interviewers distil the answers into categories or themes. For us to be as transparent as possible regarding our process - it would be false to claim that this phenomenon did not occur as analysing the answers in the actual moment enabled for follow-up questions which in turn provided a better analytical track. Yet, we transcribed the material in order to eliminate any false accounts from our part in our interpretation of the interview to enable a better analysis.

After said interviews had all been conducted, the next natural step was to sort the empirical data that had been gathered. The what's and how's according to Rennstam and

Wästerfors (2018) was looked further into, meaning several themes emerged from the data. In our collection we took notice of several themes that we had informed the respondents about and sorted the answers to what we interpreted their stance on the topic was. Although an interpretation is highly subjective and is associated to a risk certain risk, we could still sort the material well enough since it was clear whom had a more positive tone or view on a topic compared to those whom did not share such an optimistic view. Moreover, an excel-document was created which divided the material into different themes and from which hierarchical level the comments came from (managerial level or non-managerial level). In addition, other themes had also emerged from our interviews which were consequently added to the document. This helped us to find concurrent opinions from both managers and non-managers alike on certain themes that helped make this thesis problematization more interesting. Charmaz (2006), in Rennstam and Wästerfors (2018) explain the process of analysing by adding comments on memo-writing, a method used by the researcher to highlight and connect different codes. This methodology of coding was used in the authors' search for identifying key themes brought up more frequently in the interviews. Additionally, this method was also used when reviewing and analysing the survey that was given to the authors. By connecting the same question to multiple answers in the survey, they could very clearly associate respondents answers with various themes. These themes and responses tied to them were further used in relation to the identified key areas from our interviews. We would also want to point out that the used survey was conducted in 2017, however, it is our belief that this enabled a comparison through a time aspect which provided nuance to the empirical data.

One interesting occurrence in the sorting of the material is what Rennstam and Wästerfors (2018) mention as to how a sorted order may appear early in a text but that it took shape at a later stage. As we felt a certain clarity of the empirical material it did not form itself fully until a bit later on during the thesis work.

To find a form or structure for the collected data it is up to the researchers to also reduce the amount of data in order to pinpoint relevant parts which can add value to the qualitative methodology (Rennstam & Wästerfors, 2018). According to Rennstam and Wästerfors (2018), finding critical or key incidents is a good way of finding topics which the respondents associated with, to a greater extent. This phenomenon of incidents could be found in several of our interviews when we addressed specific topics. By identifying said incidents throughout the conducted interviews, it helped the reducing of the material from a thematic point of view.

The sum of both sorting and reducing is said by Rennstam and Wästerfors (2018) to culminate in theorizing. Something which has followingly been used in the chapters of analysis

and discussion to provide a basis for the reader to understand our thoughts about said case study and problematization and how it can be understood through this thesis theoretical background.

The second step in our analytical process required what Charmaz (2006, in Rennstam & Wästerfors, 2018) calls for coding. Coding is a method to put labels or to categorize specific parts of the empirical material according to the author. This part of the process is henceforth connected to the analysis in order to provide thematic sections of interest for the authors to elaborate further on. Having provided the thematic material, a discussion was held to discuss the chosen topics in relation to the theoretical material.

3.2.4 Methodological reflection

The limitations of this study are linked to the applied methodology. As a consequence, the ability and requirement to be reflexive for providing qualitative material cannot be emphasized enough. Since the nature of the qualitative approach is rooted in traditions of interpretation where subjectivity in people's social worlds, it can potentially lead to assumptions on the part of the authors in relation to the subject of study. Therefore, we believe the following as stated by Bridges-Rhoads, Van Cleave, J. & Hughes (2015), the researcher should do thorough and reflexively accounts of the research to provide great transparency. By being as open as possible, we also believe that following the above authors' remarks, it has led to provide a ground of validity for this thesis. By acknowledging limitations when exercising the methodological approach, it enabled us to consider factors such as generalizability, reliability and credibility which in turn could contribute to the overall quality of the thesis. One example is the geographical limitation whereas the study is being conducted within one organization (Tetra Pak) in a specific region (Skåne) and should therefore not be generalized as it explains a specific phenomenon. Reliability, as well as credibility, are two concepts that were taken into great consideration when we conducted our interviews at Tetra Pak. By aiming to be as transparent as possible during the whole process of the thesis, we hope to have achieved a sense of reliability and credibility. However, achieving the same result with semi-structured interviews in this context could pose a difficult problem and would thus be hard to replicate. Due to the problematic nature of replicability of qualitative and interpretive studies, this thesis would also be hard to generalize on other similar contexts. A specific Swedish context, in a specific region with a specific set of actors and interviewees provide a unique setting and cannot be found in other places.

4 Analysis

First of all, the authors would like to succinctly introduce the company and the form of environment it operates in, as well as how their respondents experience the company and certain aspects of it relating to the work of innovation. The second part looks more closely at several hindrances that have arisen and their perceived effect(s) on the company. The analysis thereafter sheds light on the perception amongst our interviewees on the external knowledge and its integration within Tetra Pak. Lastly, the chapter will summarize the various key themes identified in the analysis.

4.1 Tetra Pak Environment

To comprehend the context of Tetra Pak in a compelling way, the authors briefly introduce it from the technical perspective of the food industry in order to assist the reader to gain an improved comprehension about the context in which our case company operates. It needs to be noted that the food industry not just serves the nutrition and the overall health of almost 8 billion people on this blue planet but at the same time influences people's belief and understanding about nutrition and health as well. We all witness the fierce competition e.g.: in supermarkets, for our food consumption, food dollars and so forth. In that regard, Tetra Pak plays an indispensable role in the food industry by having been out there as a leading, mainly food & beverage packaging and packaging service provider for several decades now. Its early inventions in the food industry created a patent protected monopoly for Tetra Pak for several decades till the recent years when competition arose due to expiring patents, thus bringing diversity into the landscape of food & beverage packaging services. With the empirical data collected from a couple of employees working at Tetra Pak, this change is analysed and reflected on in this part.

Tetra Pak was founded by Ruben Rausing and built on Erik Wallenberg's innovation, a tetrahedron-shaped plastic-coated paper carton, from which the company's name was derived (Tetra Pak, 2019). It is privately owned by the family through the Swiss-based holding company Tetra Laval. Tetra Pak operates internationally through 40 market companies and due to the relatively low cost of its end products, the developing world has been a valuable marketplace for Tetra Pak all along. Ultimately, in order to succeed in today's fiercely competitive world, Tetra Pak needs to utilize its long-standing environment in a way that is aligned with the changing need of its suppliers and customers. The company also needs to

comply with changing environmental and governmental regulations and translate these threats into opportunities.

In the course of the authors' interview process, it has been thoroughly comprehended that the conditions of work at Tetra Pak have been going through a major organizational change for a while now, which in the words of a director:

“This kind of change was - I think it was 15 or 20 years ago, since we did such a big change. Now, there's a lot of things happening that we need to be kind of movable around or need to adapt, and we need to also to take discussions with the key stakeholders to see how we should work together. So, and I really liked these kinds of environments but of course, there is a lot of change involved in that. “

As it is apprehended this organizational change affects the company's environment in multiple levels in terms of the space, speed, adoptability, workflows, business development, flexibility, digitalization, and sales approach towards customers on an everyday work basis. One of the problems that did exist before and which gave rise to the newest organizational change as well was the incoherent picture that customers had of the company:

“[...] we get complaints from the customers saying that we are seen as different companies when it comes to selling process equipment or selling packaging. So that they didn't really see us as one company, so we have re-organized everything to make sure that there is one front porch to the customers.”

Thus, the organizational change was implemented for different reasons, and not having a unified front was one of them. The perhaps most important part of the quote above, is what is not being said, but namely the problems of keeping a large organization aligned. Even though this internal change is bound to change the organization, it is still in the implementation phase, as one director pointed out:

“So, our colleagues out in the markets they are going through a huge change now in terms of all the functions and how they do the business and how they do the sales to the customer.”

The same director also underlines how this internal change has huge meanings which will take some time to be fully implemented. Arguably it also means that some implementations have not had any effect yet and that new initiatives which can turn some of the hindrances for innovation at Tetra Pak around will not reach full effect until later. Furthermore, another reason why this internal change was implemented was a form of response to the ever-increasing competition due to the following:

“We had a patent on the patent in terms of the package bottom for 20 years – a technical patent, it means that it forces every competitor to buy packaging material directly from Tetra Pak for that reason, however that patent is expired and thus it’s gone.”

Even though the competition rises in the food industry in terms of food & beverage packaging products and services, Tetra Pak is still a front-runner manufacturer and manufacturing service provider based on its long-standing history. Though, the increasing competition was described followingly:

“I think competition was initially extremely scary, Tetra Pak was unused to it. As I said, it was a monopoly. I think that in the beginning when competition opened up, it was basically neglected.”

Also, the changes tell of how new perspectives have not only influenced the way Tetra Pak works with processes but consequently how they recruit people in comparison to how they used to recruit before.

“If you got hired by Tetra Pak, then Tetra Pak was very eager to hire your sons and daughters, or relatives of yours. And that's, of course, for building the family sensation. There were these core values, what you were supposed to do. If you work in the interest of Tetra Pak, working within the "family", brings a benefit. That's also to some extent changing [...]”

This is continued by the statement:

“[...] the company is hiring people on a more short-term perspective, instead of the ambition to hire for life. Like the Japanese value, if you want to join the company, you stay there until you die or retire. That was basically the ambition. I don't really see that in operation anymore.”

Ultimately, it can be noted that these prominent changes set the tone of an evolving environment which aims to answer the given and upcoming challenges in the food industry by exploring possibilities of external sources of knowledge in order to have the opportunity to establish or exploit of new ways of doing business. Given the new environment, the organizational processes are changed and new company ways of working reworked. Nevertheless, the way the company looks at innovation and knowledge are also results of an ever-changing environment in which Tetra Pak operates. However, the recent changes that accompanied the reorganization might not have influenced the view on innovation or knowledge for the company to the same extent. Although, what can be noted is the emerging trends and societal changes that have altered the view on innovation for the company in recent years.

4.2 Innovation and knowledge at Tetra Pak

During the authors' interviews, it became apparent that innovation lies at the heart of the company, and that it is somewhat very clear what innovation stands for. However, as knowledge is the basis for much innovation at Tetra Pak, it needs to be documented in order to be utilized by others:

“We have a system that we call the Development Report system, the DR system that has been there before I joined, more than several years. I think, like 30 years, and that is one of the best things that we have, I mean, the one thing with which you can really track everything, because in all activities you do, even if it's a test run, or a development project, you need to write at least one report and file that into the system.”

In addition to this, several networks exist in order to highlight and share relevant knowledge amongst employees, *“So, what we have been doing over the years that I think, are these creative, specialist networks.”* The same networks are also described as:

“They meet and then they are sharing knowledge, but they are not only sharing knowledge, they are also working and identifying, “What are the knowledge gaps that we have together?”

These statements represent that Tetra Pak realizes the need for not only documentation but also for socialization between employees in order to provoke new ideas and solutions as well as identifying gaps of knowledge. This becomes the responsibility of the network leader to steer his/her network:

“So that is basically the main responsibility of the network leaders to perform this, this yearly, TKH (technology know-how) mapping and formulate how to close the gaps, and then also to follow up these activities during the year that are supposed to close the gaps.”

Working in these networks consequently allows for gap-spotting and what knowledge is needed in order to proceed as well as determine the feasibility of specific ideas. Therefore, it seems the way of working with innovation is clearly structured on these networks, and the ideas or solutions that they can produce for the company. However, it is interesting to note how these networks closely resemble communities of practice since, *“[...] let's say that - there is a polymer network. So, then you have people working with polymers from a different organizations.”* Thus, the principle of communities of practice, in the words of Wenger, McDermott & Snyder (2002, p. 4), are groups consisting of people “who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” and can evidently in the case of Tetra Pak be identified.

Followingly, when asked the question of how the respondents perceived innovation within Tetra Pak, a certain form of discourse emerged. For employees at Tetra Pak, innovation seems to be connected to product development as it has been stated that, *“Innovation is, I mean, that is really to create new product that where you get a commercial success as well.”* This view on innovation was also supported by another specialist at the company, *“It's about bringing new things on to the markets. Turning an idea into products, basically.”* Therefore, innovation for a company like Tetra Pak is perhaps best understood as transforming knowledge and ideas into products, services, processes or working methods (Innovationcreatesvalue.tetrapak.com, 2019). Innovation is without a doubt deeply embedded

in the company culture and influences the work on many levels, as well as in pure strategic terms:

“But we always try to gather the people who have the knowledge that we believe, that we need when we make the strategy and then we make a new strategy every year.”

Innovation for Tetra Pak is therefore essential in many different aspects, ranging from how to view innovation from an employee's perspective to a grander strategic aspect. Innovation is seen as something extremely positive that can boost the capacity of the company's productions, consequently serving the ever-increasing demand and continue to count for greater income. However, working with an ever-increasing demand and striving for income can come at a cost for the work of innovation at Tetra Pak.

“Innovation is a bit “painful” for our organization – as technicians have a lot of ideas which cannot necessarily be feasible when the business part/supporting departments would take this out and market them.”

Consequently, it is noted that innovations at Tetra Pak come with restrictions. However, this is not meant to be confused with any notion of innovation, unless its connected to the business or supporting departments immediately gets thrown away. Rather it shows that in order to have innovative ideas which can flourish within Tetra Pak, it needs to be accepted by several departments before being taken further into project(s) by the company as a whole. All in all, it is thoroughly comprehended that innovation plays a vital role at Tetra Pak. However, by looking at the company culture, the reader can be served to better grasp why innovation is crucial for this leading company. Thus, in the following section the culture of Tetra Pak will be closely looked at with the collected empirical data from the interviewees.

4.2.1 Company culture

Another important imperative that became visible during the authors' interviews is the establishment of the prominent company culture which highly influences the way how available knowledge can be turned into sustainable innovations and bring those to the market in a continuous manner. Those innovations are a great interest not just for academics and the specific industry, but as essential groundings they are indispensable for the future of Tetra Pak

as well. The collected empirical data showed that Tetra Pak aims to ensure diversity in terms of its employees. This is, for instance, empowered by the company's multinational workforce, which is expressed by a director's description:

"We also have people from different parts of the world. In total, we are I think 19 nationalities. But in my team, I haven't counted them but there are perhaps 10 - from different parts of the world. Some of them are Chinese, some from Pakistan, from Japan, from Russia, and different parts of Europe. So, it's a multinational team."

This understanding signifies the size of Tetra Pak with its approx. 4,000 employees in Lund, Sweden, which consequently highlights the importance of the company culture. Also, this is influenced by the underlying vision set by the company's management as it follows: "[...] let's work together rather than to say, you know, you do this and that [...]". By digging deeper of what Tetra Pak's culture has to say about innovation, the interviewees of this research detailed how they try to establish and be part of a corporate context that is dominated by openness as in the words of an interviewee:

"[...]you need to build the company around openness, and you need to share, and you need to be open, and we are in this together, we do something good."

It can be noted that the notion behind openness is the urge for innovation with the rise of competitors on the market as well as external pressures in mind. These pressures constantly challenge employees to dive deeper, work together and explore new knowledge areas which are in line with Tetra Pak's aim to challenge the industry conventions and keep its competitive advantages. Furthermore, one of the interviewees sheds light on the importance of the individual's ambition towards innovation rather than the culture itself since he believes that:

"I think the company culture related to innovation is very strong with Tetra Pak. So, I don't think that the culture itself needs strengthening. I think it's more the impulse is the starting point for the discussion. Let's say the embryonic starting point. That's the ambition."

The interviewee also adds to the previous observation that:

“So, let's say the collegial responsibilities are quite strong, and it works in the benefit of that. And that's a fruit of the ambition to work in that direction.”

These comments hint that Tetra Pak's culture itself is quite healthy in relation to innovations which is most probably based on the long-standing history of the company. According to another interviewee, a lot of the company culture is based on family values:

“It is a family company from two perspectives. One is that the Rausing family still owns the company. And the other part is that they put a lot of effort into building a company based on family values.”

However, the collective and individual ambition of employees is essential in order to take responsibilities towards a continuously healthy and strong culture which repeatedly searches for innovation. All in all, it can be said that Tetra Pak created a culture that enabled an entrepreneurial spirit within the company, “[...] *there were so many entrepreneurs at Tetra Pak many years ago that I think set that kind of culture [...]*”. In this specific company culture, people have the chance to meet and talk to each other freely, regardless of their title. In general, the company culture seems to influence the employees to work with innovation which could be traced back to the entrepreneurial spirit that has followed the company for decades.

Yet, even if the company culture might suit the majority of the employees, voices of concern can be heard. The company culture has created too much comfort and creates a culture where, *“We do not have regular coffee breaks – as we do not have, these informal chatting or general discussions or meetings in relation to new innovation”*. The same respondent also stated that, *“We need different people in terms of background, culture, personalities and so on. This company is not really looking at the human part that much.”* Evidently, the company culture has a risk of creating too homogeneous (like-minded) thinking amongst employees which in turn might create a situation where more disruptive ideas are discarded.

In this section the company culture has been identified and reflected upon which has showed us the importance of the culture when working with innovation. The working culture itself has been characterised as open and based on formal or informal connections which will be further comprehended in the upcoming section.

4.2.2 The formal and informal

As it is comprehended Tetra Pak needs to have platforms for different groups in the presence of networks, or as the authors would like to call them, communities of practice. Tetra Pak also consists of two major parts, the formal and informal part. It is explained that the informal part consists of non-managerial employees where there is room for the sharing of ideas not necessarily connected to core functions or “actual work”. The informal platform is explained as follows:

“I think what is very important is that Tetra Pak has these informal networks, and we have a lot of discussions ongoing in the informal networks. So, and that could be - I mean anywhere, and it could be that you book meetings with some people without any other connection than that you are connected informally, so to say. It could also be that in all different occasions you do discuss and then suddenly you understand, wow, now, we have found something here let’s work on it together for a while and see what it what it ends up with and so on. So, a lot of these things that are not quantified as a specific activity, but just informal discussions.”

This was further clarified when the same respondent told us that the majority if not all ideas originally stems from the informal part of the organization. These networks are also said to create the informality that is needed to bring people together to discuss matters that are important to them and broaden their understanding of what is going on within the organization.

“I would not say that we're trying to find solutions together. It's more for knowledge sharing. [We] Work with our separate things and the network is a forum to share experiences and learnings”

Thus, the informal part of the organization acts as a forum for sharing ideas. But it also acts as a forum to act and plan on ideas in an early stage in order to make them more suitable before being proposed for more senior managers. In some cases, specific ideas might not be feasible at one moment in time and therefore, they need more time to be worked with and corrected, even though they have attracted some attention. In these cases, some ideas can become “hidden” by staying in the informal part of the organization in order to better meet the demands of the organization and senior managers at a later stage:

“But it kept on going and this was an activity that was quiet, so it was maturing at a low level for many years. And I think that was the reason why it really survived. And in the end, how it got attention and then the money and funding and so on to move up [in the organization]. But it had the possibility to look into different kinds of concepts and ideas and so on [during the time]. That’s one of the things that was really useful. It became a completely new product that’s out in the market.”

The quote highlights how the informal part of the organization can keep ideas hidden in order for the idea to mature and to be worked with during a longer period. What is perhaps even more interesting is how this above quote comes from a manager, consequently showing that also managers whom most likely are seen as more attached to the formal part of the organization can help the intellectual work in the informal part.

In contrast, the company also consists of a formal part where senior management and other non-technical departments operate. This other part acts as a counterweight towards the informal part of the company. However, for the innovative work the formal part of the organization seemed to have an ultimate authority to the point where new ideas were seen as impossible to gain attraction if they were not accepted by the formal part:

“And I think, from a Tetra Pak perspective, I think it was out of balance that the former part was too heavy. It was impossible, or, from my perspective, almost impossible to penetrate. So, bringing in something new was very, very difficult. So difficult so that it virtually never happened.”

This difficulty itself showcased why some managers felt the need to protect ideas in the informal part of the organization in order for them to gain enough traction to receive positive awareness in the company. Also, should ideas be presented, they would also risk the chance to gain negative publicity within the company:

“Yes, exactly. I mean, as soon as an activity somehow gets closed by governance, I mean it gets bad reputation, that name will be remembered. So, actually, there are activities which are the same but change name.”

The quote further explains the use of the informal network where ideas can be shielded against getting instantly discarded. Yet, the choice of whether proceeding with an idea by senior management could also be interpreted as a hygiene factor for the company.

“Innovation is, I mean, that is really to create new product that where you get a commercial success as well. So, it’s not only about creating programmes it’s really about also commercial success, then you have really done the innovation. And of course, what that mean for my people is they need to know what is technically feasible, but they also need to understand what they can be business out from this what is technically feasible. So, they need to really combine these two things when creating innovations.”

Consequently, the hygiene factor within Tetra Pak could be summarized as technical ideas meet a business perspective. Meaning the informal part of the organization meets the formal part for ideas to be evaluated and ultimately decided whether to be taken into a next step of becoming studies and ultimately projects. However, in order to gain the traction needed for a next step, each idea needs to be deemed innovative as we have pointed out earlier in this thesis. Since innovation is based on knowledge for Tetra Pak, it first and foremost needs to be both shared and absorbed into different ideas in order for them to flourish.

4.2.3 Knowledge sharing and socialization in informal networks

As the last part ended with pointing out the connection between the formal and informal parts of Tetra Pak - this upcoming part analyses the knowledge sharing and socialization in the informal part. Since these informal networks consist of engineers and specialists or as they can be called, the enablers - it became apparent that all ideas stem from these networks of the company. This is expressed through the following quote:

“So, I think the majority of the kind of technical breakthroughs and so on, it’s not coming via me. It’s coming via the engineers, they have been out on different fairs, and meeting suppliers and, you now, have their own networks that they are working in.”

Since, these networks of the company are supposed to be the birthplace of all interesting and innovative ideas that can later be presented on the market, it is fundamentally interesting

to analyse how the knowledge is being shared amongst themselves. Also, the networks are encouraged by Tetra Pak and could be said to be part of the company culture as well. This is further expressed through:

“It's clearly encouraged that if you have information that should be shared in a larger community, then you're supposed to go for a meeting to do that, the sharing of information.”

Additionally, this behaviour is something Tetra Pak tries to instil into all employees:

“And I think we were after what's called serendipity, the happy coincidence. People sitting next to each other, talking about something they don't know that they can call knowledge that could be beneficial to combine and to use for solving a problem. Or when you stand in line for the coffee machine, talking to someone and solving an interesting problem. That's what you want to address.”

However, it might require some encouragement by network leaders to get employees to share more frequently. *“I think they should be doing it by themselves. Occasionally, they need a little bit of a push.”* In the words of one network leader, this would mean that socialization is needed in order to share, but to share might require some pushing and encouraging. Although, as the quote states above, there is (in some parts of the organization) an idea within the company to create spurs or moments of serendipity. However, as one interviewed specialist said, *“We do not have regular coffee breaks – as we do not have, these informal chatting or general discussions or meetings in relation to new innovation”*. In contrast, a quote by one specialist gives us a different view on the frequency of sharing knowledge at Tetra Pak in Lund compared to other sites, *“[...] I think we are more open to share information [...]”*.

This notion of sharing is also supported by answers from the survey that was conducted in the company. In the survey, two participants stated that: *“Sure, even if not done proactively, most colleagues are keen to share their knowledge when asked for.”* and another quote states, *“I would start to talk to people that normally knows what's going on. Then I would use our excellent DR system that we can trust survives organisational Changes.”* However, in the very same survey, other respondents are not as positive.

“In principle we are all strongly aware of the need. In practice, we are often pushed away from full-fledged sharing by firefighting and other prioritised activities.”

It was also mentioned that, *“If we are to be “one Tetra Pak” we must start to communicate more over the different internal organisations.”* What can be extracted from these comments are that the size of Tetra Pak is most likely the reason why there are different opinions about knowledge sharing. With so many different networks and teams working in different segments of the company, it is bound to create different points of view. This could, in turn, show that organizational, or rather group work context is key to comprehend the mental attitude towards knowledge sharing in different teams and networks.

Ultimately, it can be said that a clear distinction lies between how much individuals at Tetra Pak believe they should share knowledge and information proactively versus how much is documented as pure organizational routines. This is best highlighted by the comment on not having any informal daily meetings in the form of coffee breaks, or what could be interpreted as “fika”. Therefore, it can be noted that knowledge sharing mentality does exist to a great extent within Tetra Pak. However, there seems to exist a discrepancy between organizational routines and individual commitments that are connected to sharing knowledge within the networks as an organizational procedure.

4.3 Knowledge problems within Tetra Pak

In this part of the empirical analysis, we want to stress the influence of various constraints which became apparent due to different factors out of which some were already understood in the form of rising competitors, internal organizational change, external pressures, etc. As it is understood, knowledge is shared within Tetra Pak to a great extent, however, the company faces hindrances in their day-to-day work activities. During our interviews, these hindrances have shown to stem from different causes and are in many cases limiting the flow of knowledge and subsequently the ability to share knowledge efficiently. One of the first hurdles can be highlighted as the inability of having enough time to read reports shared in the system as the following quote represents:

“Of course, when you write something, it’s like an iceberg. You talk about what is kind of seen on the surface. That is what you talk about, but of course, to understand the whole thing, you also need to have the unspoken knowledge. And that is more difficult.”

So, how much should I read through right? Should I talk about what I think is kind of common practice or so?”

Consequently, the lack of time could be connected to the project-based work that Tetra Pak rests upon. The projects, in turn, have very clear boundaries which limit the freedom for other forms of work:

“Today, we have more processes, thus we do not have that much freedom today also you need the time and money to do scouting and discover new innovation, thus unfortunately we don’t have much of the freedom as we used to have. It is much more controlled.”

The very same aspect of time also acts as a limiter for how much knowledge can be shared between networks, *“I think, mainly a lack of time, I guess. Most people don’t have the time to do that.”* (specialist). This could, in turn, prevent what another specialist highlights as a problem when taking ideas further:

“I don’t think that we have a lack of ideas but taking them to the next step and getting the company to buy into those new ideas. We should be focused more on how to take those new ideas into the next step, project, products.”

Although it is not mentioned explicitly, the aforementioned quote arguably shows how time limits the ability and efforts of sharing knowledge between different networks in the informal part of Tetra Pak. This results in what one specialist remarks as:

“And what I would like to say - things were quite bad when combining different technologies, ideas, concepts. We are taking one specific thing from here which is going to turn into a product. [Instead] We should take many several ideas or concepts, combine them, see something, get some unique from that, and then go for the product.”

A lack of combination of several ideas could itself be rooted in the sense of urgency which is also connected to time. The urgency of certain products and their deadlines to replace some existing products or actually reach the market has greatly affected Tetra Pak. The nature of urgency is a major constraint to Tetra Pak and will be more eminent in the future, knowing

that for instance the EU ban on the single-use of plastic straws and cutleries will get into effect from 2021 as well as the alarming pressure of climate protection. Both acts as fundamental pressures for Tetra Pak to innovate in order to remain profitable and to keep its place a frontrunner in the food & beverage packaging industry. One of our interviewees stated:

“[...] one example is the ban of plastic straws, for instance, where we need to come up with alternative so as soon as possible. And, I mean, it's not only the very sharp target set by legislation, but only so that I mean, society is demanding different things now then just five years ago, or just three years ago. And consumers and customers and, and so on. So, that that we need to address and that is reflecting our innovation, efforts very much right now.”

This statement indicates the complex position Tetra Pak is facing, not only to comply with the circular economy but also to serve the needs of its customers as well as its management board that supposedly has the following mentality: *“ they are asking for profitability from day one in principle.”* The demand for profitability could itself stem from what one previous employee stated:

“I think the very strict business focus and risk thinking has led to the conclusion that very few things were passed through from the initial ideation phase into the production phase from my perspective.”

Thus, the harsh demands for profitability created problems for a lot of ideas to be turned into projects. Evidently this could pose problems for certain ideas to be shared and for knowledge in the form of ideas, to be hidden from the rest of the organization.

4.4 External knowledge and knowledge integration

In the last part of our empirical analysis, we aim to outline the importance of external knowledge and how it is consequently integrated, thus playing a fundamental role to keep and build the company's competitive advantages. Also, it shows how it dominates the working atmosphere and context at Tetra Pak as the following quote stresses: *“I have tried to make like maps of where the knowledge is.”* This statement clearly indicates that the way of moving

forward is to try to map knowledge, where the knowledge can externally be found in the world. This is further expressed through:

“We work with knowledge management mapping. So, we map what kind of knowledge does a technical, primarily a technical network have today? What kind of knowledge do we want to have within three to five years from now? And then in the gap in between, we decide, or the network decides on what kind of activities should we execute in order to bring the knowledge in.”

Subsequently, based on those knowledge maps, the specialists scout out to discover the essence of that particular knowledge and how it could be used within Tetra Pak with or without the integration of internal knowledge in the ultimate quest for innovation. As in the case of a multinational company as Tetra Pak it is eminent to map external knowledge internationally considering the company’s future interests in terms of market player and profitability. Knowing this, one of our interviewees described its international targeting for knowledge as follows:

“So, I have actually sent five students to China. [And I've told them] "Now, you have to tell me where and how to scout for information in China." So, then I have like a guideline. What do they know? There have been some initiatives. Because there's a lot happening in China and lot of money is going into research and development. We have to know what they are doing.”

Even though China as a huge market with various potential knowledge is understandably tempting and beneficial for Tetra Pak for future possibilities, it poses some challenges. Going from an international perspective to a more domestic view in terms of the location of Tetra Pak in Lund, it has been identified that knowledge and information comes from three different sources. Firstly, cluster constellations in the region of Skåne has presumably been identified by us as a useful platform to exploit and share knowledge at the same time. Though, based on our collected data this has not necessarily been the case for our researched company, as it is stated:

“Not very much I have to say. Of course, we can get some benefit from it, but also to share what we are doing, but that’s not really what we do. I mean, the good thing with Packbridge is that it's started in this region, in the region Skåne. But I think if you were

a smaller company, that will most likely be even more important now. Tetra Pak is quite big in Lund, and we are not Sweden based in our business, such a small part of the business [is in Lund].”

On the other hand, the following has been said:

“The more influence you get from the outside world, the better it is. And of course, being in Packbridge and that community and, and getting to know companies around and people around them as well plus all the trends and so on. And in fact, this is one part of that, and it’s great. And then of course, we are better off as a company to be faster on responses to trends.”

In addition, the two other sources of external knowledge were identified as follows:

“With the supplier contacts for sure. We try to have an idea of what their expertise is. Whom to collaborate on what with. With universities, I guess we don't learn beforehand. We learn when we run the collaboration, if they are any good or not. That's more experience driven.”

Based on this statement, it is worth mentioning that various suppliers and a couple of Swedish universities are the main points of origin of external knowledge, especially Lund University due to its closeness and variety that it can offer. As it is said, *“I think there's been a collaboration with quite many different parts of Lund University.”* One specific example of how external sources of knowledge has influenced the work at Tetra Pak is the Science and Innovation talks held together with Lund University. These talks aim to identify interesting and relevant areas for the company which is then talked about by knowledgeable people from Lund University.

“Science and Innovation talks, on the other hand, was designed more to address new challenges. Things we don't know today that we need to know more about. Interesting tension feeds between two technologies or two trends or whatever. Things that we are interested in but where we don't necessarily have deep knowledge within that area.”

Tetra Pak still holds these talks in order to create awareness and interests regarding different research fields. But what is most interesting is the attempt at knowledge integration via internal knowledge and know-how and the effort of combining it with external knowledge sources. To conclude, it can be said that having several platforms for sourcing external knowledge is essential for Tetra Pak due to its international business platform, however having a close and useful relationship with Lund University has been if not the most useful source of external knowledge.

4.5 Recap: Summary of the Findings

Despite the intricate amount of empirical data and insights that the authors collected from their interviewees at Tetra Pak, they were able to identify the following four main themes. These four were presented as the *Tetra Pak environment*, the work with *innovation and knowledge at Tetra Pak*, *problems when sharing and working with knowledge* and lastly *external knowledge and knowledge integration*. More specifically, the Tetra Pak environment underpinned the history behind Tetra Pak and what the increasing number of competitors on the market meant for the company. In addition, the importance of previously held patents' expiry was outlined, which brought constant streams of revenue to Tetra Pak. Due to this major shift, new initiatives were taken to work with knowledge in order to achieve innovation. The perhaps most dominant way of working with new ideas was through the establishment of informal networks. These networks were meant to act as extensions of the company culture of sharing where engineers and specialists alike could share insights and pitch ideas to one another. Consequently, the networks have become the dominant form of sharing knowledge amongst employees.

However, in order for ideas to be accepted, the informal networks, where the ideas come from, need to pitch those ideas for the business part of the organization in the formal part of Tetra Pak. Thus, we can identify several issues, for instance, ideas are not presented due to the fear of getting them rejected and consequently gaining a bad reputation. Additionally, constraints in sharing knowledge were also shown through the mentioning of difficulties in sharing knowledge between networks. A red thread was also recognised throughout the interviews where time and urgency were seen as underlying limitations to the work at Tetra Pak, and also as it is stated by one of the interviewees, that projects were expected to bring profit from day one.

Nevertheless, in order to bring ideas to the table and letting them evolve into projects, sources of knowledge need to be combined. The external sources of knowledge are undoubtedly fundamental for Tetra Pak internationally and domestically in Lund & Sweden as well. More specifically, the company's pure location presents an opportunity with its close proximity to other eminent external sources of knowledge. Surprisingly, cluster environments have not been used to the same extent as scouting for knowledge amongst various suppliers and universities. Especially, Lund University was mentioned and identified as one of the main contributors of external knowledge. Through Tetra Pak's close collaboration with the university, the Science and Innovation talks were emphasized as one method of bringing internal and external knowledge together through several attempts to integrate knowledge with the purpose of creating interest in fields relevant for the organization.

The authors would like to put an additional comment on the recurring theme of problems when working with knowledge in Tetra Pak. This topic will not be discussed separately this thesis does not aim to explain this phenomenon. Instead, this specific theme should be understood as a consequence of the myriad of changes that have influenced Tetra Pak and how it influences several of the themes.

5 Discussion

The empirical data which was introduced in the analysis section delved into explore and portray a specific situation in relation to the research questions asked at the beginning of this paper. Firstly, the history and the context-specific influence on knowledge at Tetra Pak are comprehended which laid down the groundings for further understanding. Ultimately, as this thesis aims to establish what role knowledge plays in the process of integrating the internal knowledge within Tetra Pak with the external knowledge which can be acquired from the surrounding cluster environments, the authors discuss their empirical findings together with the used theoretical framework in this section of the paper.

5.1 A “new” path for Tetra Pak

As shown in the analysis, Tetra Pak has gone through a shift in recent times due to expiring patent rights as well as due to societal changes such as legislation where one-time-use plastic straws are meant to get taken away from the market by 2021 the very latest. This is one external pressure that urged the company to implement an internal organizational change that besides several other factors emphasize the agile working style, the importance of external knowledge in the quest for innovation as well as the new recruitment practices. Furthermore, the aspect of time has become apparent as projects need to be pushed and made profitable due to the loss of older patents and streams of revenue. Moreover, through our research, it became apparent that Tetra Pak aims to focus on scouting activities to a greater extent as to get knowledge into the company. Not just from their established suppliers in terms of new materials, but as Frenz et al., (2009) and Lopez-Sáez et al., (2010) depict, from external bodies such as: experts, consultants, customers, cluster environments, collaborations with universities and other research and development (R&D) companies. This correlates with Della Peruta et al. (2016), who argue that innovation is integrated with knowledge in terms of its learning abilities and competence of companies. Consequently, the authors stressed the importance of companies operating and scouting in certain initiatives such as the cluster environments, wherein that regard Tetra Pak could take advantage of collective efforts.

Additionally, our empirical data revealed that Tetra Pak used to be a family culture where a high degree of trust and respect towards employees were found. This statement is strongly aligned with Garvey and Williamson (2002) who depict that should there be trust, commitment, respect and loyalty between employees in an organization then informal

knowledge can be advanced and shared. However, based on our collected empirical material it has been understood that there has been a shift in the way the company recruit for new employees. Subsequently, this new view on recruitment can have implications on sharing knowledge as it possibly can alter the view on the culture of Tetra Pak. Thus, taking this “new” path as the centre notion of the company, the authors discover what the work with innovation and knowledge at Tetra Pak represent.

5.2 The work with innovation and knowledge at Tetra Pak

As pointed out in the section above, Tetra Pak has been experiencing increasing competition as well as other external pressures. Wiig (1997) highlights the necessity to focus on managing knowledge for contemporary organizations if they are to pursue economic interests. Alavi and Leidner (2001) further comprehend knowledge management as a central function for improvement and innovation to support organizations capability to compete on the market. Also, Empson (2001) adds to this topic by stating the need for creating systems or processes in order to distribute knowledge throughout organizations. In the case of Tetra Pak, the company has extensive systems for documenting, as well as clear processes for documentation, but yet employees experience problems in finding knowledge through these databases. This raises the question to why it is so? The root cause appears to be the lack of time as stated by one director. Employees do not have the time to read through entire documentations from previous projects and this is only the “tip of the iceberg” as stated by the same director. Instead, employees try to find out which person knows a specific piece of knowledge related to what needs to be explored.

It is at this stage where Tetra Pak’s’ informal knowledge networks play a huge role. As we determined before, the networks at Tetra Pak closely resemble communities of practice and thus employees have the option to share knowledge and insights within environments that solely focus on solutions or problems within their specific field. As aforementioned, Crossan et al. (1999) explain the connection between the individual, group and organization levels and how knowledge transfers back and forth through feedforward and feedback. Although the model by the authors entail different levels, it is still applicable to the communities/networks at Tetra Pak by highlighting how streams of knowledge which can be forwarded or act as feedback, which can provide renewal and continuity to the knowledge work within those networks. Consequently, knowledge in the networks can be exposed to questioning and reflection, enabling generation of new forms of knowledge (Engström & Käkelä, 2019). Hence,

we can identify how the sharing of knowledge in these networks or communities of practice contribute to the overall strive towards innovation.

In addition to the informal networks, Tetra Pak has initiated several other activities to promote knowledge sharing. One of these activities is the Science and Innovation talks. These talks are supposed to create moments of serendipity according to a former employee in charge of these talks. Nonaka and Konno (1998), Kruger and Snyman (2007) and Easterby-Smith and Prieto (2008) all highlight several methods to encourage a knowledge sharing environment. One of these factors is organising knowledge. Since the Science and Innovation talks at Tetra Pak aims to discuss different research fields connected to the work of the organization, they do so by organising events for where they make different research fields relevant. However, in order to create these events, audits to identify specific fields of interest are done together with Lund University. Such audits are moreover recommended by Swan et al. (1999) as one of three practices to work with knowledge. Hence, we can determine that the practices used by Tetra Pak are sufficiently supported by academic research.

5.3 Knowledge sharing and socialization

As we have come to understand the importance of knowledge sharing within Tetra Pak's informal networks, we can also understand how knowledge is being spread throughout the company. As Crossan et al. (1999) mentioned, knowledge can transfer between different organizational levels. This idea in the form of a model is better understood through the SECI model (Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka & Konno, 1998; Nonaka & Von Krogh, 2009). As the model explains the path from tacit knowledge and its transformation to explicit knowledge, it travels from the individual to group level and to the organizational level. Connected to the model is the idea of "justification" where knowledge needs to be accepted by others in order to gain validity (Nonaka, 1994). Throughout the interviews, a realization was found in the idea of justification and Tetra Pak's way of working with knowledge and innovation. As the informal networks discuss different forms of knowledge which can be brought into developing ideas for projects, knowledge connected to an idea goes through the same justification process as proposed by Nonaka. This process could be viewed as follows:

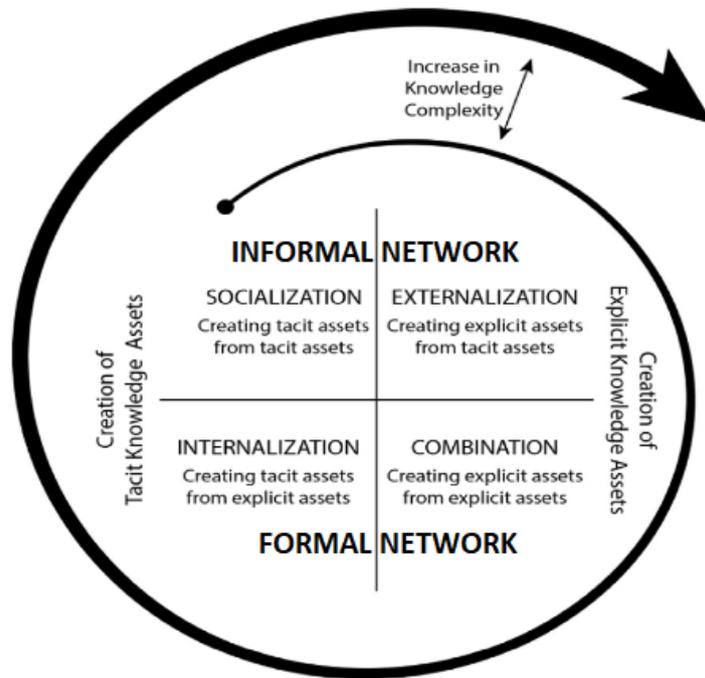


Figure 3 SECI Model of Dynamic Knowledge Creation. Adapted from: (Nonaka, 1994) - amended by the authors of this paper

As Tetra Pak is based on an informal and formal part where ideas are generated in the former part and later pitched for the latter part, a clear knowledge justification process can be discovered. Just like the SECI model explains the process of tacit knowledge becoming explicit by moving through different levels of the organization - so are ideas that get approved by the business side also enabled to get acknowledged by more employees. As knowledge is integrated and combined in the idea process within the informal part of Tetra Pak, it is subsequently justified as “good” if it passes the threshold which is gaining acceptance by the formal part of the company. Therefore, knowledge in the form of ideas is considered good and become available or explicit through a phase of justification. It could also be argued that this process enabled ideas or knowledge to be reviewed and reworked multiple times in order to be better combined until the different knowledge parts of an idea are acceptable. This phase could alternatively be described as a critical moment where knowledge or ideas are decided as possible bringers of value for the company and whether they will be shared to the rest of the organization.

5.4 Staying innovative: integrating knowledge from the external environment

As knowledge is combined in various forms to create ideas that have the possibility to bring value for Tetra Pak, a great deal of knowledge comes from the outside world. Since Tetra Pak operates in several national markets, it is also bound to interact a lot with its surrounding

environment. Tetra Pak uses three sources of external knowledge (partnerships, collaborations with Universities and cluster constellations) which is aligned with what Berggren et al. (2011) mention is the basis for knowledge integration. Tell in Berggren et al. (2011) points to knowledge integration and that it relies upon sharing or transferring knowledge, the use of similar or related knowledge and lastly on combination of specialized, differentiated and complementary knowledge. The remarks made by the author emphasizes the importance of the geographical location of Tetra Pak in Lund. With the close proximity of two universities as well as to several cluster environments and research facilities - Tetra Pak could potentially use several variations of knowledge integration.

During the interviews, knowledge mapping was pointed out as an effective tool for identifying knowledge gaps and what knowledge the company might want to learn within a few years' time. As one interviewee also told us, a couple of students were trying to map knowledge capabilities in China, and it is, therefore, safe to assume that knowledge mapping is an inherent tool for scouting external knowledge. The very idea of mapping knowledge is arguably connected to the study of Zhang and Xu (2019) where the authors point to a positive correlation between companies' knowledge breadth and knowledge depth in relation to knowledge integration. As external knowledge according to the authors contributes to the knowledge integration, the idea behind knowledge mapping for Tetra Pak could be interpreted as a process for achieving greater knowledge integration.

Furthermore, the Science and Innovation talks at Tetra Pak is also a form of knowledge integration. As the process starts with an identification of suitable topics which in that regard is a mapping of relevant knowledge areas, the process has already started. When the mapping of knowledge capabilities or knowledge gaps at Tetra Pak has been carried out, the knowledge gaps or other potentially interesting areas are presented to Lund University to show what external knowledge the company would want to know more about. Hence Berggren et al. (2011) model of the knowledge integration tells us that inputs, as well as wanted or intended outcomes (moments of serendipity), are identified through knowledge mapping.

Since Tetra Pak is based on projects and ideas passing the previously mentioned threshold, knowledge integration also serves as a tool to assimilate and save combinations of different knowledge that has been used in a project (Takhtravanchi & Pathirage, 2018; Prieto-Pastor, Martín-Pérez & Martín-Cruz, 2018). Since the SECI model unveiled the process of knowledge and ideas and the threshold it meets when trying to push through from the informal to the formal part of the organization, knowledge integration could also be understood through socialization and sharing. By mapping knowledge gaps, Tetra Pak is also mapping when

knowledge is needed from both the inside and the outside. Thus, paying attention to what knowledge is needed, ideas in the informal part of Tetra Pak has the ability to assimilate pieces of knowledge that is learnt from the knowledge mapping initiatives. By identifying trends through visiting cluster activities, identifying research processes at the university or through learning by partnering with suppliers - Tetra Pak has several ways of using the external environment. The SECI model can, therefore, explain how socialization through colleagues or external actors shape the knowledge being used in the informal part and to illuminate the mentioned threshold that controls what knowledge employees need to search for. In short, the socialization enables employees to become aware of what knowledge might be needed which allows for better knowledge integration.

However, when asked how big of a role the cluster environment plays for Tetra Pak, to our surprise, the impact of being a cluster member did not seem to provide as much knowledge as we initially thought. One possible answer to the difference in knowledge integration between cluster involvement and university collaborations could be the aspect of time as mentioned before, as well as the close research collaboration that exists between Tetra Pak and the university. It is our belief that activities such as Science and Innovation talks contribute much more to the knowledge integration because Tetra Pak has the ability to determine what kind of inputs as well as outputs that the activity should bring.

Furthermore, the authors of this thesis also believe that what could serve as a limitation to the knowledge work at Tetra Pak is a lack of socialization between networks as was told in the interviews. This could potentially create problems as an incoherent picture of what common knowledge is needed could prevent efficient knowledge integration (Berggren et al., 2011). However, we also believe that Science and Innovation talks are one possible solution for bridging networks and ideas to spark innovation. By addressing interesting areas for the company, employees at Tetra Pak are given opportunities to sit down together and discuss topics related to different working areas for engineers and specialists. In essence, the process before and after the Science and Innovation talks has the ability to create a shared understanding of topics that could be interpreted as common knowledge. It, therefore, creates a possibility for shared understanding and interpretation as mentioned by Prieto-Pastor, Martín-Pérez and Martín-Cruz (2018).

5.5 Recap: The new path, innovation and knowledge work, knowledge sharing and socialization, and staying innovative at Tetra Pak

Throughout this section, the authors have discussed how Tetra Pak aims to stay innovative by integrating both internal and external knowledge due to certain shifts such as expiring patent rights as well as societal, environmental, and governmental pressures. These factors put a great deal of importance on Tetra Pak's knowledge integration and knowledge sharing activities in the quest for innovation.

By taking these factors into account, Tetra Pak has begun to reorganize. One implementation has been to recruit differently where the company is breaking with the older style of a family culture. New routines for recruitment practices intend to bring a fresh mentality for the purpose of meeting the new challenges in the contemporary market. However, changing the mindset in these new recruitment practices might disrupt the established culture. A good culture understands the need for trust, commitment, respect and loyalty between employees in an organization (Garvey & Williamson's, 2002). Thus, the nature of Tetra Pak which is based on family values could potentially be disrupted which could affect the work of knowledge. However, we want to acknowledge the hardship of keeping a family culture for big companies in today's contemporary market.

In light of this "new" path, we have also chosen to deliberately outline the problems that the work with knowledge and innovation represent at Tetra Pak. As Alavi and Leidner (2001) state that knowledge management is a central function for improvement and innovation to support organizations' capability to compete on the market - this correlates with Wiig's (1997) view of the necessity to focus on managing knowledge for contemporary organizations if they are to pursue economic interests. Tetra Pak has extensive systems and processes for documentation which is understood as just the "tip of the iceberg" as employees also need to try to find out which person knows a specific piece of knowledge related to what needs to be explored or integrated. This is where the importance of informal networks come into play, which was understood by the authors of this paper as communities of practice. Also, Crossan et al. (1999) explain the connection between the individual, group and organization levels and how knowledge transfers back and forth through feed-forward and feedback. Subsequently, knowledge in the networks can be exposed to questioning and reflection, enabling creation of new forms of knowledge (Engström & Käkelä, 2019). Hence, we can identify how the sharing of knowledge in these networks or communities of practice add to the overall endeavour towards innovation. Additionally, Nonaka and Konno (1998), Kruger and Snyman (2007) and

Easterby-Smith and Prieto (2008) highlight several methods to encourage a knowledge sharing environment in organizations. One of these activities is the Science and Innovation talks that Tetra Pak initiated to shed light on and discuss various research fields that are relevant to the work of the company.

Furthermore, after comprehending the importance of knowledge sharing within Tetra Pak's internal networks we outlined the importance of how knowledge is being spread throughout the company. This notion is better understood through the SECI model (Nonaka, 1994); Nonaka & Takeuchi, 1995; Nonaka & Konno, 1998; Nonaka & Von Krogh, 2009). Thus, as the model describes the process from tacit knowledge and its transformation to explicit knowledge, it moves from the individual to group level and to the organizational level (Crossan et al., 1999). Consequently, the notion of "justification" is associated with the model where it explains that in order to gain validity the knowledge needs to be accepted by others (Nonaka, 1994). Thus, as it is understood, informal networks discuss various forms of knowledge which can be connected to developing ideas for projects, of which ideas go through the same justification process as it is described by Nonaka (1994). As Tetra Pak is grounded on informal networks where ideas are generated and then pitched to the formal part, a clear knowledge justification process can be discovered. Ultimately, it is described as a critical phase when ideas or knowledge are decided as potential bringers of value for the company and whether they will be shared to the rest of the organization in the quest for innovation.

From Tetra Pak's perspective, a great deal of knowledge comes from the outside world. Consequently, the "new" path outlines the grounding for the company's aim for scouting external knowledge. Since the company operates in international markets, it is no surprise that it is bound to interact with various cultures and environments. Therefore, it is fundamental for the company to scout out for knowledge in those external environments for the sole purpose of finding relevant knowledge and to integrate it. As it is described by Frenz et al., (2009) and Lopez-Sáez et al. (2010), scouting can be done in the form of searching for external bodies such as: experts, consultants, customers, cluster environments, collaborations with universities and other R&D companies. In Tetra Pak's case, the emphasis has been put on scouting for knowledge in collaborations with universities and other partnerships. Tetra Pak's use of three sources of external knowledge (partnerships, collaborations with Universities and cluster environments), is greatly aligned with what Berggren et al. (2011) mention is the basis for knowledge integration. It is also pointed out by Tell in Berggren et al. (2011) that knowledge integration relies upon sharing or transferring knowledge, the use of similar or related knowledge and lastly on combination of specialized, differentiated and complementary

knowledge. The observations made by the author highlight the significance of the geographical location of Tetra Pak in Lund. With the close proximity of Lund University as well as to several cluster environments and research facilities - Tetra Pak can potentially use several variations of knowledge integration. As it is comprehended through our empirical data, Tetra Pak mainly focuses on acquiring external knowledge from suppliers and through collaborations with several Universities, where Lund University is being one of them. This collaboration is for instance presented in the form of the Science & Innovation talks at the company. When it comes to cluster environments, Tetra Pak is part of one of them called Packbridge. Even one of our interviewees sits on the board of one of the clusters - it has been understood that the opportunities of these cluster environments are not yet fully explored and used by the company.

Appealingly, based on our collected empirical material at Tetra Pak we did not find that much of exploitation of the opportunities that cluster environments can represent. Nevertheless, the model by Berggren et al. (2011) of the knowledge integration underpins our finding that inputs are identified through knowledge mapping, as well as wanted or intended outcomes e.g. moments of serendipity. In that regard, the notion of mapping knowledge is arguably aligned with the study of Zhang and Xu (2019) where the authors point to a positive correlation between companies' knowledge breadth, depth, and knowledge integration. As a final remark, as external knowledge contributes to knowledge integration, the idea behind knowledge mapping for Tetra Pak could be interpreted as a process for achieving greater knowledge integration. It mainly focuses on two external sources: suppliers and university collaborations with the sole purpose of being innovative and having competitive advantages.

6 Conclusion

This thesis has explored innovation and knowledge with Tetra Pak as a case study. With the help of a series of interviews, the authors have tried to create a better understanding of how internal and external knowledge through knowledge integration and knowledge sharing is used in an effort to reach innovation. For the reader, we, therefore, will summarize our findings as well as theoretical contributions to provide an ample presentation of this thesis contribution in relation to the problematization and research questions. After this exposition, future research will be discussed followed by notions on practical implications.

6.1 Empirical Findings

As this study aimed to explore internal and external knowledge through knowledge sharing and knowledge integration, four main themes have emerged. These themes are the Tetra Pak environment, Tetra Pak's work with innovation and knowledge, challenges in sharing and working with knowledge and external knowledge and knowledge integration.

The first recognised theme, the Tetra Pak environment was identified and consequently incorporated into the analysis and later discussion as it explained the historical background, the internal organizational change and external pressures which aided to serve as a grounding to better comprehend as well as underpin the latter themes. Ever since Tetra Pak first started, the company has had success and is still considered successful to this day. The backbone for much of this success rests on the earliest patents and design which enabled Tetra Pak to generate large revenue streams. Also, ever since the start of the company, the goal of the Rausing-family has been to operate the company as family friendly as possible. This has meant that family members had a chance of joining the company if one member were already working at Tetra Pak. This nature of acts helped to shape the same family culture that Tetra Pak is known for having. Consequently, the culture at Tetra Pak also assisted in creating the form of trust and commitment amongst employees that the company is associated with.

However, after decades of prosperity, patents have started to expire, and the once steady streams of revenue are not that steady any more. In combination with the increasing competition in the food & beverage packaging industry, this has led to a sense of urgency for the company as well as uncertainty for how to deal with competition. The "newfound" position has taken effect on Tetra Pak, and as a response of meeting future obstacles, Tetra Pak decided to reorganize the entire company which has been running for a while now. Subsequently, new ways of working have emerged.

The second finding relates to Tetra Pak's work with innovation and knowledge where we found that two parts of the company, the informal and formal part are essential in understanding how ideas are turned into projects and innovations. As most of the ideas come from the informal part of Tetra Pak, it is also in this part where a lot of informal networks reside. These networks are the same as communities of practice, meaning they gather employees based on in which area they work in. Based on these prerequisite members of a specific network can share, discuss and inform other members on ideas, knowledge etc. These networks can thus be seen as platforms, where a lot of knowledge sharing, and knowledge generation are taking place. Nevertheless, in order to tap into a lot of the internal knowledge of Tetra Pak, the company works a lot with documentation and writing reports in order not to lose any knowledge from activities. Additionally, knowledge mapping is used by Tetra Pak to determine what knowledge is missing and what knowledge the company would like to obtain within a couple of years. The idea behind the knowledge mapping is to create awareness regarding which knowledge is going to be needed to be able to work within specific fields in the future.

The third finding is very closely connected to the second one as the second finding describes the foundation for knowledge sharing and socialization. However, this theme takes a deeper look into the networks and the socialization amongst employees since it follows up the notion on the informal as well as the formal part of Tetra Pak. In order for ideas and pieces of knowledge to be accepted into becoming a project that can add value to the company, they must first be presented and later accepted should they be accepted in the company as a whole. Thus, knowledge and ideas, regardless of whether they stem from internal or external knowledge, are discussed and shared in the networks and also in project groups. Whilst in the informal part, different pieces of knowledge can be assimilated and combined to provide better ideas which can later be pitched. Having the two parts of the organization works in the sense that ideas can be sanitized by identifying their business applicability and if one idea is rejected it can always be reworked.

The fourth and final discovery in the empirical material is how Tetra Pak works with knowledge integration. As already mentioned, knowledge mapping is used to assess the knowledge situation to know what knowledge needs to be searched for. The perhaps best example is the Science and Innovation talks, where interesting knowledge areas connected to different parts of identified work at Tetra Pak. The knowledge is then provided by Lund University by experts in the field and is conducted in a manner to evoke a state of serendipity. Thus, the outcome of the process is already determined, however not guaranteed. What was

most surprising in this theme was the emphasis on university collaboration and collaboration with other partners and not with clusters themselves. By having a firm grasp of the geographical proximity and the opportunities of the cluster constellations, as well as delving deeper into their possible effects on Tetra Pak, interestingly enough it was a surprise for both authors that the company does not make many advantages of being part of those cluster constellations. Instead, it turned out that supplier partnerships and university collaborations could provide as fundamental external sources of knowledge whereas clusters were good for trendspotting.

6.2 Theoretical Contributions

As this thesis is based on several theoretical ideas, the intention has been to integrate them in order to better understand a specific process. This process has been the integration and sharing of knowledge and how it can contribute to the innovative work of organizations. The work with knowledge is seen as imperative for contemporary organizations (Wiig, 1997; Empson, 2001). Furthermore, it is stressed that knowledge and innovation are interconnected concepts (Cohen & Levinthal, 1990; Drucker, 1993; Darroch & McNaughton, 2002; Merx-Chermin & Nijhof, 2005). Nevertheless, stating this connection is most likely nothing new to the reader. Instead, this should be seen as the theoretical base for this thesis aim which is to develop a profound comprehension of what role knowledge plays in the process of integrating the internal knowledge within the researched company with the external knowledge that can be found in the surrounding cluster environments.

This thesis has also pointed to the learning organization due to its promotion of knowledge management (Oliver & Kandadi, 2006). Additionally, a learning culture is sustained through concepts such as knowledge sharing, collaboration, open innovation (Cheng et al., 2019). Also, inspiration has been taken from the organizational learning model by Crossan et al. (1999) to gain a better comprehension of the learning organization. In order to get the external aspect of this thesis problematization, the incorporation of cluster environments, and particularly clusters of innovation and knowledge networks were mentioned (Della Peruta et al., 2016; Volgmann & Münter, 2018; Wang & Zhang, 2019).

Even though the aforementioned theoretical areas are many, they serve a purpose to act as the foundation for the SECI model and for the concept of knowledge integration. From our study, we identified that we could contribute to the fields of knowledge sharing and knowledge integration by adding external knowledge to the equation. There seemed to be a lack of literature combining external knowledge to the SECI model in order to explain the influence

of external knowledge to the knowledge generation process. With the help of our Tetra Pak interviews, we can conclude that Nonaka's (1994) SECI model can be interpreted differently by adding external knowledge through knowledge integration. As Berggren et al. (2011) explain the integration as a process which can, therefore, be inserted into the framework of the SECI model and explain how companies such as Tetra Pak combine and share internal and external knowledge to gain innovative capabilities.

6.3 Limitations

During the work of this thesis, a number of limitations were identified. These limitations will, therefore, be accounted for in this chapter. First and foremost, as the empirical data was gathered and analysed, it was comprehended that the reorganization that was mentioned by the respondents was hard to grasp. This was due to two reasons. Firstly, the sheer size of Tetra Pak creates a picture that is hard to grasp, especially so when the number of interviewees is a minority of all workers at Tetra Pak. Even if the respondents had different positions, it would be false to claim that their views represent the whole company. Therefore, the second reason was how the number of interviews served as a limitation for this thesis. They were, however, able to give interesting and insightful answers and we believe conducting observations on top of the interviews could have served as a valid alternative approach.

The second limitation was connected to the first, meaning it was hard to fully understand the impact of the reorganization. As the analysis and discussion are based on a story explaining the history of Tetra Pak and its adaptability to recent changes, it was hard to grasp the full extent of said changes. This has in turn created a lot of analysing as to better explain a situation that was still ongoing and, therefore hard to determine the effects. Still, the gathered material was coherent in its explanation of what changes have been made to the specific section of the company that was part of this study.

A third limitation was based on our interviewees' knowledge about cluster constellations and their experience from them. As some interviewees were unable to fully comprehend our interest in cluster constellations, it created a barrier for further questions regarding external knowledge in relation to clusters. However, the topic of knowledge integration could be further expanded during all interviews and thus gathering empirical data on this topic did not limit the thesis in general.

6.4 Future Research

As this thesis was restricted by a given time frame, it was unable to fully measure the extent of the knowledge sharing and knowledge integration. Hence, additional studies should be carried out in order to fully comprehend the correlation between knowledge sharing and knowledge integration. As this study took advantage of the close proximity of clusters (clusters of innovation/knowledge networks) and Lund University, we believe this provided a certain edge to this thesis but also serving as a delimitation. Consequently, we believe future researchers should focus on conducting studies in other similar geographical areas with the same composition of knowledge-intensive companies, universities and cluster constellations. As this was a Swedish example it is by no standards universal in its explanation and could, therefore, benefit from further research in other national or international settings similar to this thesis.

Moreover, this study used semi-structured interviews which Gill et al., (2008), McIntosh and Morse (2015) and Kvale (1996) underscore several benefits. However, we came to the conclusion that conducting observations during network meetings and during Science and Innovation talks could have had a big benefit to this thesis. In this case, applying observations could provide further material in order to unearth the knowledge integration process as proposed by Berggren et al. (2011). Thus, future researchers taking on this endeavour should aim to incorporate observations into their studies.

Future researchers could also benefit from identifying how organizational change initiatives affect the way organizations work with internal and external knowledge through Nonaka's (1994) SECI model and Berggren et al. (2011) knowledge integration process.

6.5 Practical Implications

As Berggren et al. (2011) mention knowledge integration as a process which we the authors have followingly adopted into this thesis, researchers that want to do a similar study need to recognize the processual nature of this theoretical framework. Also, since the SECI model is based on a process as well, it cannot be stressed enough that observations are most likely a powerful tool to validate any comments made, should the researchers choose to proceed with interviews. Additionally, interviewers for a study of this character also need to find relevant interviewees that operate in roles which can complement one another's statements. Since innovation and the work with knowledge is hugely different in the work of an HR-worker and an engineer, the researchers need to decide what kind of knowledge is being used in

different roles. As this study focused on knowledge that was used to further the innovative work for the organization, we were able to use the empirical material from various interviewees in a coherent way. Aiming for the “whole picture” by diversifying the interviewees might not achieve the result the researchers are striving for.

The last remark for the researchers to consider is to inform the interviewees as thorough as possible before conducting the interviews. Explaining the concepts which are meant to be discussed beforehand could eliminate any confusion during the actual interviews which in turn could support to get more elaborative answers.

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