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School of Economics and Management

Implementing Capability Development

A study of the external partnerships and internal development mechanisms utilized for capability development

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May 25 2021

Master's Program in International Strategic Management

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Abstract

The primary purpose of this paper is to further build on research related to capability development in order to explore hindrances and benefits of internal capability development and external partnerships as ways to improve performance. The beverage industry is used as the focus context since the companies in this industry are increasingly responding to external trends and looking for ways to develop their competitive advantage accordingly. Therefore, this study explores the different methods used for capability development to overcome today's challenges with a focus on technology solutions, innovation, and external trends. The theoretical framework is based on literature related to capabilities and their corresponding process, innovation, the importance of external trends, and capability development implementation modes. generated by adapting to external trends. The study was conducted using a qualitative approach and built its findings based on multiple case studies from five Scandinavian beverage firms, along with perspectives from the Food Technology department of Lund University and an enzyme biotechnology firm. The empirical data used semi-structured interviews and secondary sources related to the industry's trends and research development strategies to contextualize the research and introduce the main findings of the primary data. The results firstly showcase that external trends have a bilateral relationship to the decisions and strategies companies make concerning internal development and external partnerships, meaning a company has the ability to create a trend through their capabilities as well. Secondly, current capability assessment is vital to decide the process of capability development implementation modes and the corresponding decisions that it entails. Consequently, due to this cyclical process of capability development, the study highlights that the conclusive result from internal development and external partnerships is the enhancement of existing capabilities.

Keywords: Capability development, External partnerships, Internal development ,Technological capability, Innovation capability, External trends and opportunities, Competitive advantages, Company's performance , Capability enhancement, modes of implementation

Acknowledgments

The finalization of this thesis would have not been possible without the support of several people. First, we would like to express our sincere appreciation to our supervisor, Dr. Thomas Kalling for his ongoing guidance and recommendations throughout the whole process. We highly appreciate his positive encouragement and flexibility in carrying out this project.

Secondly, we would like to thank the companies used for our case studies for giving the time and willingness to be a part of this research. The core of our study would not have been possible without their valuable insights and contributions.

Thirdly, we greatly appreciate the motivation offered by our friends and family and being the source of inspiration.

Lastly, thank you Lund University School of Economics and Management for giving us the opportunity to meet amazing people and have this unique learning experience.

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1. Introduction

1.1 Background

"Defining your enterprise business capability is part art and part science, and building your business capabilities is more science than art" Pearl Zhu *(Innovative Corporate Global Executive and author)*

One of the crucial challenges that organizations face is being able to distinguish which changes solely require developing new technological capabilities and which require adopting different strategic beliefs (Tripsas & Gavetti, 2000). The adoption of different beliefs could be achieved by the building of other types of competences that accompany technological development. Due to this, the characteristics of the capability development path can highly vary across firms. According to Spitsberg et al. (2015), a new external technology has a high potential to increase internal development, however in order for it to lead to commercial success, the firm must combine technical capabilities and business competencies. Survival in today's business environment characterized by high complexity,demands companies to have multiple capabilities (Huang & Huang, 2020). Different types have been discussed by researchers as highly influential for the success of the firm. Helfat (1997) states organizational capabilities are the components that enable firms to create new processes and products, as well as to respond to market change. Additionally, the development of dynamic capabilities creates more innovative and adaptive businesses (Inan, 2015). These enable sustainable competitive development by contributing to the firm being adaptive capability (Teece, 2007). One of the core dynamic capabilities suggested in literature is R&D development, which is considerably significant in the context of technological opportunities. However, this is not a precedent for every firm. Smaller companies might find it difficult to finance R&D activities and rather place their efforts in producing products according to customer needs by developing innovation and product development capabilities (Inan, 2015). Other emerging

types such as entrepreneurial capability specifically associated with emerging market ventures relying on external resources and accessing knowledge pools is being analyzed as an important component of firm growth (Xiao, Lew & Park, 2021).

External trends are important factors that influence capability development and pose an influence on how firms decide to implement such. A clear example are sustainability trends as driving forces for product development which influence the ability of businesses to invest in capabilities (Hallstedt et al. 2020). Furthermore, in alignment with this driving force is environmental innovation. In this aspect, the external influence is highly relevant as researchers have identified some of the antecedents of this type of innovations are pressure from consumer and industry norms and innovation resources (Rodriguez & Wiengarten, 2017). Dynamic technology innovations are another trend that have shaped many global industries as it is one of the factors shaping the nature of global markets (Chang, 1996). External activities and knowledge influence capabilities to vary in response to them and develop accordingly (Li Ying, Wang & Ning, 2016). Furthermore, these variations to a certain extent cause an influence in the way firms reconfigure their resources. For firms to be able to survive and succeed in competitive environments, they must continually adjust and reconfigure their processes and resources (Malhotra, Gosain & El Sawy, 2007). A connection can be drawn between the emerging external trends and the development path of capabilities in firms.

Open innovation is a model that can contribute to capability development. The basis of open innovation is opening the innovation process allowing inflows and outflows of knowledge with the purpose of both accelerating internal innovation and increasing the external innovation for markets (Dahlander & Gann, 2010). Hence, open innovation follows a dynamic approach for the development of the firms, alongside the integration of achieving competitiveness. Open innovation also requires deep capabilities and new approaches of management in the integration of technology (Bogers et al.2019). Furthermore, it is important to clarify open innovation is not solely about outsourcing R&D but rather focuses on leveraging and enhancing internal capabilities. This can be achieved by enhancing one's business model with external knowledge or exploring a new one (Bogers et al.2019). Open innovation offers a possible solution to the arguments concerning internal development and external sourcing of capabilities. According to Helfat et al. (2006), several arguments in existing literature suggest that for firms to renew capabilities and thrive, it is

fundamental to focus on skill development in both external sourcing and internal development. The benefits of internal development include exploiting and protecting specific knowledge (Helfat, 1994). External sourcing provides a solution for organizational inertia, and guards against obsolescence (Rosenkopf & Nerkar, 2001). External links also allow access to different technologies and resources that can complement the internal processes of the firm (Nieto & Santamaria, 2007). In the process of the external knowledge search, firms may display two forms of orientation which are collaborating with science technology partners and with industrial partners (Ferreras-Mendez et al. 2019). According to these authors, the interaction with industrial partners increases in depth market knowledge and increases capabilities related to product commercialization. On the other hand, knowledge from science technology partners provides the opportunity to explore new areas in technology and expand the firm's technological knowledge base (Un et al. 2020).

The benefits of collaborations are explored in research in multiple and various forms, for example according to Dyer and Singh (1998), accessing complementary resources from partnerships contribute to the firm's ability to develop and improve core competencies. Considering internal development and external sourcing as two modes of capability implementation, firms can either select to adopt one or combine both. Firms that are able to select appropriately and accordingly between them may be more effective in capability renewal and gain performance advantage in the long run (Capron & Mitchell, 2009). Furthermore, to choose is a great challenge for firms, as they have to distinguish between conditions that align with internal development and those that align with external sourcing. It is vital for firms to understand the conditions under which these modes of implementation are more appropriate for developing new capabilities (Jacobides & Ballinger, 2006). Assessing the constraints of current ones and those related to the internal context is expected to help firms at developing capabilities when choosing between external sourcing and internal development (Capron & Mitchell, 2009). Capron and Mitchell (2009) also conclude that firms that consider their constraints based on current capabilities and other internal factors when deciding between internal development or external sourcing will survive longer than those that fail to assess such constraints. The authors consider it valuable to further research on the relationship between the firm's constraints, modes of sourcing, and ultimate performance. Additionally, there are limitations in current studies concerning intermediate mechanisms that examine how all the types

of capabilities operate to achieve organizational performance (Huang & Huang, 2020). Thus, a further exploration of the process concerning internal development or external partnerships as mediums to overcome constraints that emerge in capability development and the factors that determine these decisions of implementation can contribute to existing research.

1.2 Problem Statement

Considering the previously discussed implications, it becomes visible that there are diverse arguments in research concerning the benefits of external partnerships vs internal development for capability building. For example, Helfat (2000) explores that change can be constrained by initial capabilities and accumulated knowledge base. Therefore, in such cases external partnerships can be interpreted as a possible solution for higher adaptation and change. According to Rigby and Zook (2002), even organizations that are characterized by active internal innovation cannot rely only on internal sourcing. On the other hand, internal knowledge is also viewed as a necessary starting point to know how to use external knowledge in an effective way (Cassiman & Veugelers, 2006). An internal and basic research capability is vital to monitor research conducted outside the organization (Rosenberg, 1990). Therefore, it cannot be completely disregarded and rather than creating a constraint, internal research capability is considered the basis of the capability development process. Open innovation is an example of a framework that might be utilized by firms to attempt the combination of both internal and external development. However, this is not applicable to every firm as there are several factors and hindrances a company might face when choosing to implement an open innovation strategy. For example, in some cases market restrictions of the flow of external innovations can lead to higher costs for open innovators (West and Gallagher, 2006). Additionally, according to these authors being able to move the results of research into development through open innovation is a common challenge. If firms are not able to identify the relevance of the external knowledge it provides no benefit for them. Furthermore, the current studies emphasize the importance of selecting appropriately whether internal development or external partnerships work best for the company's context, but do not specify the factors that determine this decision. No large- scale studies explore the extent to which the ability to select the appropriate mode of sourcing improves the creation of new capabilities and survival in dynamic environments (Capron & Mitchell, 2009). Additionally, when exploring the

complementarity of combining both, being able to understand the conditions in which these activities may complement is vital (Porter & Siggelkow, 2000). The idea of complementarity becomes more relevant for management by identifying the contextual factors that affect such (Cassiman & Veugelers, 2006). These authors also conclude that success does not solely depend on the implementation or even the combination of both but also through creating the right context. For future research, they suggest searching for the factors and characteristics within the firm that affects this. This signifies that exploring further the corresponding process and evaluation firms should implement to be guided in the right direction is valuable to create such conditions. Additionally, the benefits of either mode of implementation are discussed, but there are few studies that explore the mechanisms and steps taken through each form of capability development to overcome constraints in the process. For a more applicable understanding, it might be considered contributing to explore deeper into the factors and context characteristics that should be considered when implementing capability development through either one or a combination. In order to provide an adequate comparison between both, it is important to evaluate the results that firms obtain in the development of their capabilities after investing corresponding effort into either implementation form.

1.3 Research Question

Deriving from the above problematization, this study aims to address the following research question:

How does overcoming constraints through internal development or external partnerships influence the outcome of capability development?

1.4 Research Aims and Objectives

The primary aim of this study is to identify how two different forms of capability implementation are utilized to overcome constraints firms face and the consequent outcome of how internal development vs external partnerships lead to capability development. External factors that impact an industry to develop capabilities are considered important components of causation for this research. As external trends can cause an influence for firms to head into a specific internal or external direction of capability development. This is explored by utilizing the beverage industry as the focus of this research. For this purpose, the industry is analyzed through an empirical study addressing the responses of European beverage and biotech firms to new technological opportunities and nutrition trends. Through this analysis, our objective is to extend the theory of capability development primarily comparing how internal development of capabilities and external partnerships are utilized to overcome constraints and the subsequent results that are achieved for a firm's capabilities through each one. In order to achieve the purpose of the study, other sub objectives are considered important to fulfill:

- Identify the relevant technologies that currently influence nutritional sustainability in the beverage industry.
- Identify types of capabilities being developed as a response to the external technology opportunities and trends in the industry.
- Provide further insights for the framework concerning the impact of external partnerships in capability development in comparison to internal development.

This research intends to extend current literature on capability development by identifying how the relevant technologies that impact the beverage industry translate into the development of specific capabilities. Additionally, considering there are diverse arguments in research concerning the benefits of external partnerships vs internal development, we intend to explore deeper the decisions and implementation of firms concerning these modes of capability development. Consequently, identifying recommended methods that enhance the success of the capability development road as a pathway for improving the competitive advantage.

1.5 Research Limitations

The first limitation identified is the scope of the research only focuses on the beverage industry and due to the time period of two months, on a small number of firms in this industry. Consequently, the characteristics and mechanisms we identify for capability development can not necessarily be generalized to other industries. Additionally, size and location for firms might be other determinants of our concluding recommendations resulting in less applicability to other companies in different markets and with a larger availability of resources. For example, the firms directly interviewed are located in Europe which entails a delimitation to comprehend if the inputs can be applicable to the development of capabilities for companies established in developing markets.

Another limitation is the limited range of technologies being explored; different types of technologies might represent different levels of technology uncertainty for firms. Technology uncertainty encompasses factors such as the amount of change required by a company to adapt a new technology when compared to existing technologies (Stock & Tatikonda, 2004). The technologies and firms we investigate do not provide an overarching representation of the technological adaptation across different industries and corresponding needs.

Lastly, considering the focus of the study is business oriented, the research does not include detailed specifications of the technical qualities and processes of the explored technologies. The benefits and the impact of technologies for nutrition sustainability are described in simple terms to facilitate understanding to the reader and maintain the business perspective of the study.

1.6 Thesis Outline

First of all, a literature review is provided to explore previous research on capability development, and the role of innovation in capability development. Additionally, the impact of external trends and technologies is discussed leading to the modes of implementation, specifically external sourcing of capabilities vs internal development. The literature review is concluded with a summary that encompasses the relationships between external trends, capability development, and implementation sources. Thereafter, the methodology section states the research approach and the

reasoning behind the choice. The methods of primary and secondary data collection are included in this section. To conclude this third section, the validity and reliability considerations of the study are described. The fourth section is focused on the empirical data obtained from primary and secondary sources. Moreover, the fifth section contains the data analysis of the gatherings obtained in the previous section. In section six, the concluding remarks will be stated, the theoretical and practical implications will be presented, as well as the recommendations for future research.

2. Literature Review

2.1 Introduction

The literature review focused on illustrating the concept of capability in the company by defining the most vital types of capabilities related to this study. It continues by exploring related frameworks in capability development and the challenges in this process are discussed, further transitioning into the impact of external trends on capability development. The chapter finalizes with the modes of implementation, internal development and external sourcing through partnerships which lead to the completion of the intended framework.

2.2 Definitions of Capability

The term Capability has been defined, studied and explored by scholars throughout the years and is consequently defined in a broad term as knowledge, experience and skills that companies invest in, develop and foster in order to employ their resources to the fullest extent to give them an edge over their competitors (Gamarra & Zawislak, 2013). Furthermore, strategic capability is described as the competency of an enterprise to take actions that are envisioned to affect its long-term growth and development (Lenz, 1980). The previously mentioned statements explain the term capability in an all-encompassing spectrum, there are several types of capabilities studied due to the term having various meanings. For instance, capabilities may involve absorptive capacity, technological capabilities, organizational capabilities, dynamic capabilities, marketing capabilities, intercultural capabilities and operational capabilities (Gamarra & Zawislak, 2013). However, the focus will be primarily on three categories of capabilities which are absorptive capability,dynamic capability

and technological capability. These three types will be defined and explored further as they affiliate more with the objective of the present study.

According to Cohen and Levinthal (1990), absorptive capability is defined as the aptitude of a firm to distinguish the significance of new external information, integrate it, and employ it to profitable ends, being crucial for the company's innovative capabilities. Absorptive capability is fundamentally a function of the firm's level of previous associated information. Thus, this capacity may be fashioned as a derivative of a firm's R&D investment. Supplementary efforts indicate that absorptive capacity may also be established as a byproduct of a firm's industrial functions. Cohen and Levinthal (1990) have noted that through direct involvement in manufacturing, a firm is more suited to acknowledge and exploit new information. Consequently, absorptive capability is highly related to innovation capability which is defined as the ability to develop new products that can gratify the market needs, execute superior technological practices, adopt firsthand products and high-tech practices in the future, and respond to the movement of unpredictable technological changes (Aulawi, Govindaraju & Suryadi, 2009). Innovation capability highlights the role of technology. Hence, it is important to explore the meaning of technological capability which is defined as the ability to achieve any pertinent technical function or capacity activity within the firm involving the capability to cultivate new products, procedures and to activate facilities efficiently (Ruiz Ortega, 2010). Lastly, dynamic capability explores the three previously mentioned capabilities as it is defined as the firm's processes that utilizes resources to assimilate, revamp, benefit and release resources to create market change (Eisendhart & Martin, 2000). Thus, dynamic capabilities are the strategic routine by which companies accomplish first-hand resource configurations as markets transpire, collide, divide, develop, and die (Eisendhart & Martin, 2000). Dynamic capabilities are the tactical routines by which executives modify their resource base, acquire, and shed resources, merge them together, and recombine them to spawn new value creating strategies (Eisendhart & Martin, 2000). Accordingly, dynamic capability is the driving engine behind the foundation, development, and restructuring of other resources into new sources of competitive advantage (Eisendhart & Martin, 2000).

2.3 Capability Development Process

This section will explore how companies use capabilities to survive. Researchers defined the process of refining capabilities as a capability development road which refers to "creating a new capability or enhancing an existing one" (Teece, 2016). This method is necessary for firms to be able to sustain its competitiveness and succeed in the market. Therefore, there have been some frameworks that explain the stages of capability development and evaluation. A common theory is the capability lifecycle (CLC) and as explained by Helftat and Margaret (2003) capabilities are similar to products, meaning they sometimes follow noticeable patterns in their development path which typically starts by the founding stage, the development stage and finally the maturity stage. However, not all capabilities follow the same model so instead of maturing, some capabilities can be transformed to a better version by the influence of external sources. Hence, in the process of development all capabilities have the potential to change by adaptation and learning from external factors (Helfat & Margret, 2003).

Nevertheless, it is worth mentioning that although capability lifecycle might seem simple since the development follows patterns, there are many factors that influence the capability development process. Additionally, it is vital to avoid assumptions that firms approach the same capabilities, to determine competitive and sustainable advantages, researchers should evaluate when firms approach different potential capabilities (Rockart & Dutt, 2013). Hence, it is essential to understand challenges that face capability development and its relation to performance. A significant internal factor related to managerial practices that hinder the development of capability is associated with the knowledge and experiences of employees in the company. According to Tripsas and Gavetti (2000) the process of capability development can be tricky since some companies focus extensively on their core competencies. Consequently, that could lead them to be biased and have a narrow view of other areas that should be further advanced in the firm and this is called path dependency trap (Leonard-Barton, 1992). Moreover, another common managerial error that the company faces in the process of capability development is management inertia. This challenge occurs primarily when implementing a new technology as a way to improve company's performance in which the reaction of management to this technological change is slow (Tripsas &

Gavetti, 2000). Moreover, according to Gaimon, Ozkan and Napoleon (2011) when deciding to implement a new technology to further develop a company's capability, the expectation of the benefits might not go as planned. For instance, the cost could be incorrectly estimated or the training of the workforce on using new technologies could also fail (Gaimon, Ozkan & Napoleon, 2011). In the next section, more challenges that face capability development will be discussed in relation to innovation and technology.

2.4 Innovation

2.4.1 Innovation and technological capability

Typically, capability development and company's performance are linked to the firm's ability to innovate. Moreover, as noted in the capability definitions section, innovation is highly associated with the technological advancements in the firms. Therefore, there have been different studies which suggested that firms with greater technological capability have better and increased performance (Gamarra & Zawislak, 2013; Garcia-Muiña & Navaz-Lopez, 2007; Coombs & Bierley, 2006; Huang, 2011). As stated by Guerra and Camargo (2016), there are several explanations which can validate advancing technological capability that include the necessity for developing and upholding in-house capabilities, the variations in technologies underlying the control system, R&D, and stronger ties with universities, research institutes, and other organizations.

Moreover, technological advancement is linked to innovation as discussed by Acosta-Prado, Campos and Longo-Somoza (2014) , whose research explains that technological capabilities of strategic operation are accountable for attaining incremental innovations that enhance some of its current characteristics until an alteration befalls the exciting technology. Additionally, the decisions made to invest in technology are in support of capability development with general emphasis on explicit technologies (Ivanova, Elswah & Fidock, 2020). However, the explained assumptions are biased because it takes into consideration only one aspect of capability development and innovation that heavily focuses on technology as a driver for innovation and improved performance (Gamarra & Zawislak, 2013). Furthermore, others argue that development of technological capability of a company predominantly hangs on four pillars which are, the

company's present technology, behaviors and skills of individuals and organizational skills and behaviors (Acosta-Prado, Campos & Longo-Somoza, 2014). While this section focused on the relationship between innovation and technological capability, the next section will cover innovation as a potential driver for dynamic capabilities.

2.4.2 Innovation and dynamic capabilities

As stated by Zawislak, Alves, Gamarra, Barbieux and Reichert (2012), innovation capability is not only related to technology but can be perceived as an all-round competence including the capacity to captivate, to acclimate and to transmute a specified technology into particular management, operations and business deals that can make the firms more profitable. Furthermore, innovation capability is comprehended as both the technological knowledge gaining process from the firm interpreted into the technology development and operations capabilities, as well as the decision-making and procedures represented by the administration and transaction capabilities. The integration between these four capabilities efficiently stimulates innovation that eventually leads to creation of competitive advantages in the firm (Zawislak et al. 2012). Furthermore, innovation is part of the dynamic capability concept explained in the section related to the capability definitions and as stated by Javanmardi and Kavoos (2014), innovation is one of the frameworks of dynamic capability and is a tool for capability development. Several researchers emphasize the influence of product innovation on the development of a firm's dynamic and organizational capabilities (Javanmardi & Kavoos, 2014; Tatikonda & Montoya -Weiss, 2001; Francis & Bessant, 2005). Additionally, the process of innovation is complex and depends on the capabilities dispersed throughout the firm (Guan & Ma, 2003).

However, this capability to innovate is affected also by external sources of opportunities in the market and these sources could be demographic, technological, and social trends (Drucker, 1985). Moreover, as suggested by Alvarez and Iske (2015) empirical evidence revealed that internal capabilities and the external knowledge gained from external sources complement each other. This empirical evidence also suggests that the higher the internal capabilities of the firm, the higher is the effect of external knowledge on the firm's innovative process. Additionally, capabilities that

encompass external factors for the innovation process are identified as open innovation capabilities (Behnam, Cagliano & Grijalvo, 2018). The previously mentioned supports the notion of external opportunities as a driver for innovation capabilities which leads to better dynamic capability development in the firm and this aspect is further explored in the next section.

2.5 External Market and Technological Trends

2.5.1 Identifying Opportunities

Teece (2017) states dynamic capabilities should have the ability to be adapted as a response to changes in the business environment and market. These capabilities enable firms to develop assumptions about how external technology opportunities, business problems and consumer preferences are evolving. According to Teece (2017), to understand how dynamic capabilities can be applied as components that lead the firm to respond adequately to a key trend, they can be divided into three activity clusters. The three primary groups are the following: *sensing* capabilities to identify and assess technology opportunities and customer needs, *seizing* capabilities to mobilize resources to act on such opportunities, and *transforming* capabilities for a continuous renewal. Li-Ying, Wang, and Ning (2016) state that to understand the entire potential of accessing external technologies, it is vital for companies to routinely develop dynamic capabilities. They suggest considering technological diversification while following up with R&D expenditures.

Additionally, in the process of identifying opportunities it is vital to adapt management practices according to the company specific requirements, referred by Gebauer (2011) as contextualization. Gebauer (2011) states that management innovation plays a role in building capabilities through the application of contextualization. In this argument, management innovation refers to the implementation of management processes and practices that are innovative and intended to achieve organizational goals. According to this premise, such innovations that contribute to capabilities cannot be solely obtained from external sources and implemented, the change must be developed from inside the company as well. New technologies cause an impact on several factors such as product quality, showcasing that the impact is not solely determined by the technical characteristics of the technology (Foden, 1989).

2.5.2 Importance of External Trends

The trends defined by customer needs are considered significant drivers for the innovations of firms. When a customer's needs and wants explicitly determine the firm's engagement in innovations, there is a higher probability of commercial success (Poudel, Carter, & Lonial, 2018). Moreover, the proactive dimension of capitalizing on new product opportunities caused by the external forces in the market generates a competitive advantage. According to Foden (1989), new technology and ideas lead to capabilities that open entire new forms of competition. Additionally, he states 60-80% of innovation is a consequence of identifying a market need, with the majority being improvement of existing processes and technologies. A smaller portion is caused by a discovery of a new technology. These market needs are commonly associated with global trends. Global trends can disrupt entire categories of business and have the power to transform, for example the trend of healthy living is a relevant trend that is causing great impact in the food industry (Arenas-Jal et al. 2019). Due to society undergoing sustainable and digital transitions, services provided by companies are high determinants of value (Hallstedt, Isaksson & Rönnbäck, 2020). Consequently, the methods and processes of firms used to develop systems and products are highly impacted, especially as the rate of change in society dramatically increases as evident from the current pandemic these development processes must evolve rapidly. Hallstedt, Isaksson and Rönnbäck (2020) state that among the main driving forces is the integration of sustainable living, to steer into this path requires radical innovations and improvements. Adhering to this aspect, businesses are being driven to invest in capabilities associated with the development of sustainable products and innovation.

Considering external trends to be important drivers of capability building and innovation, the way businesses react to them is crucial. Trends are defined by features such as organizations becoming platforms where stakeholders and partners continuously work together to create a service or product customized for the various market niches (Pisano,Pironti & Rieple, 2015). Due to the disruption of new technologies, consumers have immense power to lobby for change and easier access to information (Arenas-Jal et al. 2019). These aspects contribute to companies seeking to find solutions alongside their customers. For example, consumers are seeking uniqueness, product personalization, and demanding to be involved in the production process (Arenas-Jal et al. 2019).

Additionally, firms are making changes in their business model patterns to react to different emerging trends. Technological innovation is a way to capture value into a firm's business model, however there is a tension between the business model existing for the current technologies and the one required to adequately exploit an emerging external technology (Chesbrough, 2010). According to Pisano, Pironti & Rieple (2015), any new trend can change the competitive arena, there is always the possibility of disruption caused by new technologies that lower costs, change terms, or develop more convenient solutions for customers. In an environment of constant technological change, such changes can be valuable opportunities for companies when anticipated or significant threats when firms ignore the impact of such trends (Savioz & Blum, 2002). Consequently, technological preparedness is desired, however not all firms are able to respond adequately. For example, small and medium sized enterprises have restricted resources in comparison to companies with large R&D departments (Savioz & Blum, 2002).

2.5.3. Anticipation and Implementation of Technologies

Technology Intelligence has become a field of great interest due to the increasing awareness of an environment of technological change and the willingness to take advantage of such (Savioz & Blum, 2002). Additionally, the complexity and speed of technological change increases the demand for internal and external technology, as well as effective decisions concerning these technologies. According to Savioz & Blum (2002), through the adoption of technology intelligence companies can improve in early identification, analysis of technologies and the effective communication of the impact on the enterprise. Forecasting is considered an important method to anticipate technological trends and achieve technology intelligence. Savioz & Blum (2002) define technological forecast as predicting future characteristics of techniques, procedures and machines encompassing the elements of probability, characteristics, time and technology. Considering the ability to create customer value is linked to a firm's success, a company requires adaptive capability to develop products suitable to the target customers (Chang, 1996). One way to be prepared for upcoming trends is adaptive generalization which consists of reinvesting the firm's resources to improve the ability to adapt to a future environment characterized by uncertainty and dynamic changes.

Another concept that aligns with technology intelligence is technological learning, which is defined as the process in which a company that is technology driven creates and renews their capabilities based on its tacit and explicit resources (Carayannis & Alexander, 2002). Furthermore, this process combines both administrative learning aspects and technical components. In such processes, firms may encounter technology uncertainty which is defined as the lack of knowledge concerning how to obtain and implement the technology of interest (Stock & Tatikonda, 2004). Under this concept, an important factor is technology novelty which refers to the degree of experience with this specific technology and how much change it represents in comparison to previous technologies. According to Stock & Tatikonda (2004), it is fundamental for companies to be aware of the degree of technology uncertainty as this leads to an increase in information processing requirements.

2.6. Modes of Implementation

2.6.1 Internal Development or External Sourcing?

As firms encounter the processes of capability development, they must assess constraints concerning their existing capabilities when choosing to proceed with internal development or external sourcing of new capabilities (Capron & Mitchell, 2004). It is important for companies to be aware of their capability gap, which is defined by Capron and Mitchell (2004) as the distance between the existing base of capabilities and the needed capabilities. Furthermore, different capabilities and roles are necessary for each of the phases of the development process, which also translates to the importance of an ongoing development of capabilities (Salehi et al. 2018). When firms decide to develop capabilities through external sourcing, commercial and technological renewal is facilitated due to the company being exposed to new geographic markets, product environments and technological domains (Capron & Mitchell, 2009). Additionally, through external sourcing firms can overcome capability deficiencies due to a faster reconfiguration of capabilities in comparison to internal development. Other arguments related to the external sourcing of capabilities discuss how vertical integration of firms influence the technological capability process. According to Wang and Chen (2018), less vertically integrated firms are more

likely to rely on external partners for the supply of needed technologies, additionally they may be more flexible to switch to new suppliers according to the new technologies needed.

While some argue for internal capabilities being main drivers of innovation and others place external partnerships as the key for innovation, both aspects highlight important components of innovation which translates into them not being mutually exclusive (Su, Tsang & Peng, 2009). For larger firms there is evidence that integrating many external sources in innovation is of great promise for their success (Brunswicker & Vanhaverbeke, 2014). External partnerships play a fundamental role in shaping innovation performance by offering opportunities to explore knowledge. Studies rarely are exploring the importance of internal specialized knowledge while combined with external partnerships (Su, Tsang & Peng, 2008). According to Su, Tsang and Peng (2008), internal capabilities play the role of the foundation to adequately identify and explore external partnership opportunities, which consequently also result in exploiting internal capabilities. Through this argument, they conclude that what impacts a firm's innovativeness is the combination of external partnerships and internal capabilities. Firms should dive deeper into this combined impact on the company's performance (Su, Tsang & Peng, 2008). Furthermore, complete and radical departures from existing capabilities are high difficult for firms, therefore the internal sources play an important role in the overall evolution of the firm's capabilities (Helfat, 2000).

2.6.2 Relationship to Strategy and Performance

The decision of technology sourcing is considered a vital component of a firm's overall competitive strategy and positioning (Zhara, Sisodia & Das, 1994). A viable technology strategy that comprises the need for external vs internal technology development is considered by many companies of fundamental strategic importance (Jones, Lanctot & Teegen, 2001). According to Jones, Lanctot and Teegen (2001), challenges arise for both startups and established firms because of limited resources that constrain their strategy, this tends to cause a greater impact to smaller firms in industries where technology is rapidly changing, and larger firms have more access to technical resources. Additionally, in several cases firm performance is impacted negatively when external technology is acquired, and internal resources are limited. Many firms that have internal

technologies available have a lower tendency to seek obtaining technology from external sources (Jones, Lanctot & Teegen, 2001). In contrast to the negative association of external partnerships and performance, Sabidussi et al. (2014), states that the external acquisition as a complement to internal R&D efforts contributes to innovative performance. Additionally, the prevalence of the open innovation perspective in firms is largely acknowledged by the business community. Focusing a firm's strategy on the integration of external sourcing modalities such as alliances and mergers and acquisitions have a positive impact on the performance of firms (Sabidussi et al. 2014).

2.6.3 External Partnerships

The types of external partnerships relevant for firms differ based on factors such as the size of the company. For example, some of the external sourcing strategies for SMEs include minimal searchers, supply-chain searchers, technology-oriented searchers, application-oriented searchers, and full scope searchers (Brunswicker & Vanhaverbeke, 2014). Additionally, these strategies combine different external sources of innovation such as network partners, direct and indirect customers, suppliers, universities, and research organizations. Certain factors such as the high increase in the cost of R&D and the fall in its productivity has led firms to bring a wide range of partners to collaborate including the previously mentioned and even competitors (Chen, Vanhaverbeke, & Du, 2015). However, the results of these collaborations vary across firms, companies such as Procter & Gamble have reduced in-house R&D by unlocking the potential of these external sources, in contrast other firms lose control of their own knowledge when engaging and relying solely on external knowledge. According to Chen, Vanhaverbake, and Du (2015), there is a positive impact caused by collaborating with different types of external partners and there is a stronger effect on performance with the collaboration of value chain partners, universities, and technology service providers.

Crucial knowledge is often found beyond the boundaries of firms, which requires firms to tap into external knowledge in order to develop and maintain competitive advantage (Carayannopoulous & Auster, 2009). The locus of innovation does not reside inside the firm, rather in the intersections of the external partners and the firm (Powell, 1990). Even though emerging technologies have a high potential for value creation, the market encompasses characteristics such as high uncertainty,

high risk and increased interdependence with other firms (Easingwood & Koustelos, 2000). As a result, it is fundamental to establish relationships and networks both for established businesses and new entrants (Salehi et al. 2018). When analyzing whether companies should form alliances or acquisitions, Carayannopolous and Aster (2009) discuss how the resource-based view offers insights of whether a firm will choose either. In contrast, critics to this aspect state that RBV is limited in high velocity environments because it provides more emphasis on developing current competencies and capabilities, rather than acquiring new and external knowledge (Eisenhardt & Martin, 2000).

When companies engage in strategic technology alliances, the expectation is to impact the long-term product-market combinations (Hagedoorn & Dyusters, 2002). An important component of alliances is innovative capability, which is defined by Hagedoorn and Dyusters (2002) as the specific competences and expertise concerning the introduction and development of new products and processes. Furthermore, the flexibility that alliances offer provide opportunities to learn through less structured agreements which is beneficial due increasing technology intensity in several industries. On the other hand, in sectors characterized by low tech efforts, formal control offered by options such as M&A's might be preferred (Hagedoorn & Dyusters, 2002). It is not appropriate to confirm a "one size fits all" when it comes to knowledge sourcing, even though research-oriented organizations firms such as biotechnology firms are pressured to access external knowledge to achieve competitive advantage, many alliances fail to achieve the set objectives (Carayannopoulous & Auster, 2009). Additionally, 86% of organizations lack the criteria to adequately choose between alliances and acquisitions.

It is vital to also acknowledge additional risks that can arise from external partnerships. For instance, sourcing new capabilities externally can cause opportunistic expropriation, underinvestment of suppliers, leakage of proprietary knowledge and contractual problems (Capron & Mitchell, 2004). Consequently, firms that have lower legitimacy and lower contractual risks tend to seek external capability development. Due to firms differing in their ability to utilize and combine their resources for the creation of new capabilities, the modes of implementation also differ (Capron & Mitchell, 2004).

2.7 Chapter Summary and Theoretical Framework

This chapter's objective is to first provide insights into the current perspectives of capability development, including different types of capabilities and how they evolve, the challenges that arise in such development and its relationship to innovation. Additionally, the impact of external factors, specifically technological trends, and the implementation of such is overviewed to set the causation element of our research, signifying that external factors play a fundamental role in influencing capability development processes. As discussed by Teece (2017), it is vital for capabilities to adapt in response to external changes in the market. Furthermore, capabilities are used to enable the firm to build and renew resources to innovate according to changes in the business environments. The mechanisms utilized to overcome current and upcoming challenges in this specific pathway of developing capabilities as a direct response to trends is yet to be explored thoroughly.

The last portion of the creation of our intended theoretical framework is the mode of capability development, in which we suggest that the external sourcing of capabilities through different types of partnerships is most likely to create competitive advantage and improve innovation performance in comparison to solely internal development. Under this premise, internal development lays a foundation for capability development and partially can be very influential but most likely will still need external sources for complete progress. According to Chen, Vanhaverbeke, and Du (2015), external sources have strong potential to influence companies to exploit these opportunities, consequently reducing their internal R&D. Additionally, the combination of collaborating with different external partners has a positive impact on the performance of the firm. Moreover, it is important to consider factors and context in the company that play a vital role in the choice of the capability development implementation the company will take. As this decision is a major element of the company's strategy, it gets influenced by several elements (Francis & Bessant, 2005). Thus, we believe that the mechanisms to overcome constraints can be achieved more successfully through the external sourcing of capabilities. The argument of combining internal development with external sourcing is also discussed in this chapter, therefore it becomes a relevant factor to be taken into consideration in the framework of our research. Our goal is that

this framework increases the understanding on how firms can improve the process of overcoming constraints in capability development.

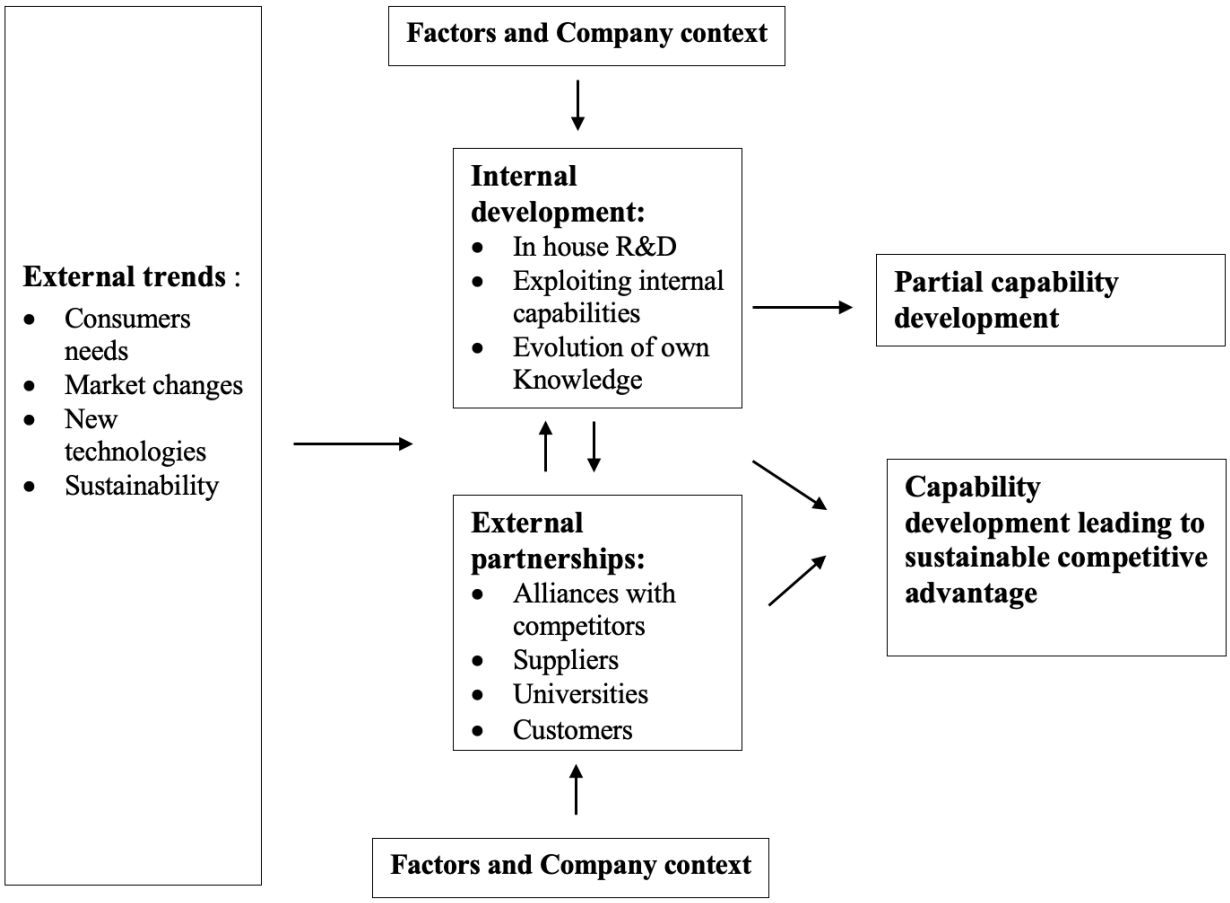

Figure 1. Preliminary Framework

3. Methodology

This chapter provided the reasoning behind the chosen research approach and design to achieve the objectives set for the study. Additionally, it focused on the collection of data and the sequential steps for the corresponding data analysis. To conclude, the limitations of the qualitative case study approach, as well as the implications on reliability and validity were discussed.

3.1 Research Approach

The primary purpose of this research was to identify what mechanisms are utilized by firms to overcome constraints in capability development with focus specifically on internal development, external partnerships and the factors that affected their decisions. This was achieved through an exploration of previous studies on the influence of innovation and external trends on capability development, and furthermore on internal development and external partnerships as implementation modes of such a process. The insights provided by the literature led to the development of our preliminary framework used as the basis for testing through an empirical study of companies in an industry characterized by ongoing trends of technology development. Due to such characteristics, our study is considered exploratory. When we investigated the different approaches utilized for the empirical study, we found the quantitative method to be less fitting for the purpose our study as it does not allow for direct interaction with the participants for further explanation on their answers, it follows a certain order and is structured with predetermined variables and hypothesis (Daniel, 2016). Whereas the qualitative study follows the exploratory orientation and allows for a wider understanding of the data collected (Daniel, 2016). Therefore, we deemed appropriate to use a qualitative approach to our study. One of the forms of using literature in a qualitative approach is framing the problem based on the introduction of research available at the beginning of the study (Creswell & Creswell, 2018). We based our initial structure on these criteria. Additionally, primary data was collected mainly through interviews, one of the

most common procedures for qualitative research, considering the aim was to explore and understand the perspectives of actors in the industry to gain the adequate insights to extend current literature on capability development. Qualitative strategy allows the researcher to uncover underlying values, beliefs, and assumptions (Yauch and Steudel, 2003). The data was analyzed abductively as it allows for flexibility in the framework and entails constantly moving back and forth between the literature and data analysis. Additionally, it involved deductive attempts to validate the preliminary framework in order to eventually reach the best reasoning (Yin, 2009).

3.2 Research Design

The research question in this study has the objective of exploring the capability development process. To enable acquiring in-depth knowledge about such processes in a particular industry, the case study qualitative method was chosen for research design. The case study design allows for in depth exploration of new phenomena while at the same time maintaining the holistic characteristics of real-life occurrences (Yin, 2009). Furthermore, the theoretical framework of this study is complex and aspect rich, so case study design is considered the best way to answer the theoretical question as it has the ability to analyze more complex phenomena (Larsson, 1993). Utilizing the case study method and the use of specific samples for the empirical study added new aspects and expanded on previous theories related to capability development process and the effects of external partnerships by applying analytic generalization. This approach allowed for the transferability of particular results from specific case studies into other possible fields (Maxwell & Chmiel, 2013). Additionally, case studies have the benefit of an understanding of contextual factors. Case studies are associated with the exploration of a process (Creswell & Creswell, 2018). Initially, it was expected that the research questions would evolve and change throughout the study, therefore the qualitative case study design was consistent with these possibilities. It is common in qualitative studies for the questions to be reviewed and reformulated (Creswell & Creswell, 2018). Throughout the process of gathering findings, modification in our initial questions was prevalent. A multiple case study approach is utilized consisting of five Scandinavian beverage companies as the subjects and basis to explore the process of implementation of innovation in these firms, consequently identifying the mechanisms utilized for capability development associated with this adoption. Internal development and external partnerships are defined as the objects for the

analytical frame. By using a multiple approach, we were able to compare cases and find patterns that contributed to the insights retrieved from our analysis of data. The application of multiple case studies identifies patterns and uncovers divergent themes (Zach, 2006).

Case studies are an adequate method to examine new processes within an organization (Yin, 2003). Considering our intention to examine the modes of implementation of technologies in organizations, defining the subjects and objects as previously described was deemed appropriate for the direction of our research. Our aspiration was for the multiple case study design to abductively identify new contributions to our preliminary framework. Considering our aim to identify the mechanisms for capability development, the initial review of theories was fundamental as a starting point for the case study design. Case studies should begin with previous literature examination as a guidance for reflecting on the research questions and objectives (Ravitch & Riggan, 2011). Our research followed this design to accomplish linking the study from the beginning exploration into our analysis and conclusions derived from the empirical findings obtained through the case studies.

The case studies focused on five beverage firms operating mainly in Sweden and Denmark since this area has growing innovation initiatives for food and beverage. In addition, to the new startups and the supportive infrastructure of accelerators and incubators (Halloran, 2019). These companies were Smakis, Naturfrisk, Bornholms Mosteri Good idea drinks and Østerberg Foods. We selected them to be our sample as we found their products to be interesting in terms of their responses to the external trends in the industry. For instance, Smakis and Naturfrisk are focused on organic beverages, Bornholms Mosteri strategy is about using mainly local raw materials and regional specific fruits, Good Idea Drinks is associated with the growing health and wellness trend whereas Østerberg Foods is focused on exotic flavors with no added sugar. They are affected by external trends and they have ongoing research for the development process of their products. Moreover, in our initial research we found that some of them follow internal development strategies and others use the combination of both internal and external to acquire competitive advantages. Therefore, these selected companies were useful to test our preliminary framework. The positions interviewed were the CEO/Founders for three companies to obtain a holistic perspective on the company's capabilities and future outlooks. Additionally, for the other two companies we approached the Chief Scientist Officer and Product Development Director to have a beverage

technology expertise perspective on the product development process and innovative considerations. Moreover, it was important to also include aspects from biotechnology companies and universities as they are considered to be important collaborators that have influence on the beverage industry. Therefore, we included the perspective of a senior food technology professor in Lund University and a chief scientist in a German biotechnology company.

3.3 Data Collection

Qualitative research approach allows for in-depth responses from participants, it gives a room for open-ended replies and enables more interpretation (Ronald, Drummond & Carmara, 2007). The process of data collection started by exploring companies' reports in the beverage industry leading up to conducting interviews about the topic. Hence, the data used for this study included both secondary and primary data to provide a concrete insight on the capability development road in beverage companies. Further explanation about the methods of primary data collection and the secondary sources applied is described in the following sub sections:

3.3.1 Primary data

Primary data collection includes different methods and a quite common way of conducting qualitative study is to interview participants and establish the meaning of a phenomena from their viewpoint (Creswell & Creswell, 2018). Although the study is focused on companies which are mainly in Europe, conducting online interviews was the most convenient and possible approach to get primary data considering the social distancing restrictions for safety concerns. The interviews were semi-structured in which we drafted questions but also allowed participants to talk more about the aspects they found related in the context of their firms and experiences (Easterby-Smith, Thorpe & Jackson, 2021). This structure gave us more related topics to further investigate and examine their relevance especially in the field of technological capability and the influence of market trends on the firm's decisions. Moreover, the participants were highly knowledgeable and well informed about the themes and topics explored. The questions used for the interviews we conducted are found in Appendix A.

3.3.2 Conducting interviews

The participants were contacted using LinkedIn and the information email on the targeted companies' websites. The interviews were mainly conducted virtually to allow the scheduling to be more flexible. During the interview, background about the research and purpose of the interview was further discussed. Additionally, the participants were asked for their consent to use the information they provided in the case study. However, some participants had concerns which are primarily related to direct quoting in the case studies and these concerns were addressed. Moreover, the sampling of participants was based on practical and theoretical knowledge of the thesis topic. In the list illustrated in Table 1, there are five participants from beverage companies, one participant from university research and one participant from a biotechnology firm. Hence, the questions of the interviews were slightly adjusted to align with the background of the respondent.

Table 1 List of respondents:

No	Respondent	Organization	Position	Area of expertise	Country	Date	Interview length
1	Yvonne Granfeldt	Lund University Department of Food Technology, Engineering and Nutrition	Deputy head of department	Food and Nutrition	Sweden	08.04.2021 10:00	40 min
2	Erik Östensson	Smakis	Founder/CEO	Beverage	Sweden	05.05.2021 15:00	30 min
3	Tørk Furhauge	Naturfrisk	CEO	Beverage	Denmark	10.05.2021 15:00	30 min

4	Nicklas Rathje	Bornholms Mosteri	CEO/ Administrative director	Beverage	Denmark	12.05.2021 11:00	30 min
5	Anonymous Respondant	Anonymous 1	Business Innovation Director	Enzymes Biotechnology	Germany	14.05.2021 13:00	20 min
6	Elin Ostman	Good idea Drinks	Chief Scientist	Beverage	Sweden	17.05.2021 15:00	20 min
7	Cathrine Østerberg	Østerberg Foods	Head of product development	Beverage	Denmark	19.05.2021 8:30	20 min

3.3.3 Secondary data

Although secondary data is more structured and easier to navigate, it can be easily misanalysed especially when data is generated for different purposes than the purpose of the thesis which intend to utilize (Bryman & Bell, 2015). Nevertheless, these sources contain material that gives fast access to highly relevant information thus it saves time, and together with the primary data will allow for better interpretation of the problem (Hox & Boeije, 2005).

The secondary data included beverage and biotech companies' annual reports, sustainability reports and media releases. These sources gave us a perspective about the major technology and investment opportunities these firms are exploring. Moreover, exploring major consulting firms reports about market trends guided us to create a link between the business and the societal aspects. In addition, the European Commission and UNESDA Soft Drinks Europe reports provided us with orientation on the latest health concerns. Furthermore, we used the list of companies participating in sustainable food and beverage initiatives to direct us to the aspects that need to be addressed in the primary interviews. Therefore, by cross referencing all the aforementioned secondary sources we were able to interpret the data and link it to our research objective.

3.4 Data Analysis

The interviews used in this study were conducted in the period of two months. Thus, the interviews were spread out which gave us more time to compare the findings in the interviews with the empirical research and the secondary data we collected. Furthermore, for the data analysis we followed the steps suggested by Creswell & Creswell (2018) and it proved its effectiveness since it gave a structured way to break down the findings. Hence, the first step in this framework was to organize the information by transcribing interviews and highlighting the most related aspects. When conducting this step, we concentrated on the data that was highly related to the interpretation of the thesis questions so we used our judgment on the level of details that should be included (Bailey, 2008). Moreover, in all the interviews we were both present which gave us the opportunity to equally follow up on the relevant aspects and to filter out the inapplicable data from the notes especially since all the interviews were semi-structured, certain data was irrelevant. The second step was coding which is the process of organizing the data by categorizing and labeling the finding by using terms in the margins (Rossman & Rallis, 2012). The primary coding scheme used was the preliminary framework that resulted from the previous literature insights. Hence, the data was grouped by the processes and ideas in common among the interviewees in relation to the components of the framework. The next step was to generate themes and detailed descriptions of the categories coded which will allow us to connect the different concepts and cross reference the ideas they have in common. This step was essential to build complex connections as we went beyond the basic definitions to interrelate sophisticated concepts (Creswell & Creswell, 2018). This step was the initial phase for organizing the data; hence, pattern matching was utilized by comparing the predicted theoretical pattern and the observed one in the collected data (Sinkovics, 2018). Specifically, the flexible pattern matching technique was used as it is most suited for exploratory research and it allows for more flexibility in linking the empirical pattern and theoretical framework (Sinkovics, 2018). The final step was to draw the most logical way to present and categorize the different interviews and case studies to make the argument flow in a coherent way. This was achieved by interconnecting themes by using a narrative passage to present the findings (Creswell & Creswell, 2018). Moreover, in the final step of analyzing the data triangulation method was utilized to provide a solid understanding of the results by comparing the

answers of respondents from different backgrounds (Carter, 2014). This was achieved by the use of data source triangulation in which data was collected from collaborators (university and biotech firms) and the beverage companies' founders or employees. Afterwards, this data was compared again with the outcomes from secondary sources to develop a comprehensive understanding and present the related findings in a logical way (Carter, 2014). Consequently, the process of data analysis was an iterative process as we went back and forth to improve and add to our findings (Sirvastava & Hopwood, 2009), also enabling us to identify more questions about possible gaps to be able to create possible links to our theoretical framework.

3.5 Quality of the Study

3.5.1 Limitations of Qualitative Case Studies

One of the limitations present in the data collection of qualitative studies is the presence of bias in interviews due to the presence of the researcher (Creswell & Creswell, 2018). The responses of the actors in the industry might be prone to avoid revealing negative aspects or detailed constraints of the processes being explored. To avoid this during the process, the line of questioning was structured in ways that attempted to gain insights without soliciting a certain established expectation. Another problem that may arise is the generalizability of the findings, this is an important aspect of caution as qualitative research is intended not to generalize but to develop themes in specific contexts (Creswell & Creswell, 2018). This can become more evident when studying various cases, as the results of additional data might be generalized to apply to initial cases. To avoid this issue, throughout the study, specifically when analyzing the findings, it was highly attempted to maintain the particularity aspects of the research objectives. As developing case studies can be time consuming, the constraint of a limited amount of time can have a negative effect on the outcomes of the study.

3.5.2 Validity

Validity in qualitative research is based on ensuring the findings are accurate, it is vital to incorporate validity procedures in the research process (Creswell & Creswell, 2018). Validity also aligns if the results obtained are in line with the original intentions of the study (Easterby-Smith et al. 2015). Credibility is one of the significant terms that address validity (Creswell & Miller, 2000). To achieve credibility, it is fundamental to follow methods for obtaining high quality data that has been analyzed carefully (Patton, 1999). To be highly familiarized with the beverage industry as the context of our study and be prepared with previous knowledge for the process of data collection, we reviewed several sources of secondary data to gain a credible understanding. Before the investigation, it was vital to obtain such comprehension of the context in order to align the knowledge as a method to validate the accuracy of our findings. Spending prolonged time in the field being studied and gaining an in-depth understanding leads to findings being more valid (Creswell & Creswell, 2018). Another strategy implemented to add credibility was discussing the discrepant information that emerged to encompass other perspectives and be realistic about the results. Due to reality being characterized by different perspectives that do not necessarily coalesce, through a discussion of contrary information credibility is added to the account (Creswell & Creswell, 2018). This was also achieved by the use of the aforementioned triangulation method in which the data gathered from people from different backgrounds was compared to test the validity of our findings and ensure the results were trustworthy (Carter, 2014) . Lastly, the findings of our study were detailed and descriptive to contribute to the authenticity of the process. By using thick and rich descriptions as a strategy to convey the findings, the results become both richer and realistic which highly contribute to the validity of the findings (Creswell & Creswell, 2018).

3.5.3 Reliability

Reliability in qualitative research refers to the consistency of the researcher's approach across different projects and researchers (Creswell & Creswell, 2018). It is vital for researchers to document detailed procedures and their corresponding steps for the case studies for qualitative reliability (Yin, 2009). One of the procedures utilized to ensure a reliable case study protocol was paying adequate and complete attention to interviews. This was achieved by recording the interviews and afterwards transcribing them. Additionally, to ensure that team research did not

affect the consistency of the study both researchers were always present in the interviews followed by well documented discussions of such that led to a comprehensive analysis. Coordinated communication in team research is one of the suggested qualitative reliability procedures (Creswell & Creswell, 2018). Such procedure also aids in guaranteeing a higher level of consistency. The utilized interview protocols and transcripts are included in the study to guide others to understand the process and contribute to the possibility of repeating the study. To be able to repeat the findings of the case study in a new one, the qualitative procedures must be well documented (Creswell & Creswell, 2018).

4. Empirical Findings

The following section includes the findings from both secondary and primary data. First, an overview of the industry background will be presented. The objective of this section is to increase the reader's comprehension of the industry's context and the subsequent case studies. The primary data is in the form of case studies based on interviews with experts from academic and professional backgrounds.

4.1 Industry background

Beverage companies nowadays are looking beyond their core business values to create strategies that would support them to adapt to the changing market and the economic uncertainty (Colbert, 2020). This section provides relevant information obtained from industry reports, annual reports, sustainability reports, and news coverage of beverage companies. about factors which affect the beverage industry. These include laws and regulations, emerging trends for consumers and innovative technologies. Additionally, it showcases initiatives of companies in terms of internal and external innovation initiatives for the capability development strategy.

4.1.1 External Trends

Sugar reduction

One of the most significant trends that is constantly changing the consumers behavior and is increasing in popularity is the sugar reduction trend (Colbert, 2019). Therefore, the trend was explored further in the European market as it is the main focus of this study. In 2015, the European Commission set a framework that targeted sugar reduction by a minimum of 10% by 2020 compared with the one in 2015 and highlighted the importance of reformulating some products

such as soft drinks, juices and other sugar sweetened beverages to achieve that target (Robinson, Louro Caldeira & Wollgast, 2018). Thus, some European countries such as Estonia, France, Ireland, Portugal and the UK started to implement taxes on sugar sweetened beverages in the last 5 years (Obesity Evidence Hub, 2021). As a result of the sugar tax implementations many companies radically changed their operations and reduced the sugar in their products (WHO European Childhood Obesity Surveillance Initiative (COSI), 2020). Furthermore, in the UK in a study made on the sugar reduction progress between 2015 and 2019 the results showed that there was a decrease of 43.7% on the sales of total sugar content beverages and an increase of 54.2% on lower sugar products with no tax imposed on it which typically include less than 5g of sugar per 100ml (Coyle, Little, Williamson, Dodhia, Targett, Montel, Mildon, Hutchinson, Owtram & Tedstone, 2021). On the other hand, some European countries that have not implemented sugar tax policy launched different projects with aligned goals. For example, Sweden considered an all-encompassing approach by beginning a project that focuses on reducing health problems by promoting sports and physical activities as a key to reduce obesity and have a better lifestyle mainly among the youth (The Local, 2016). Additionally, European organizations such as UNESDA Soft Drinks Europe announced that in a study on the beverage sector in Europe there was a decrease of 14.6% of added sugar between 2015 and 2019 and this outperformed the target set to the beverage firms by the European commission (UNESDA, 2020). In addition to significant investments in product development to reformulate beverages in order to have less sugar and calories (UNESDA, 2020). UNESDA sees this reduction as a voluntary effort from companies in Europe to reduce the added sugar levels in drinks and adapting to the changing mentality and the concerns related to health and obesity. Particularly considering that not all the European countries imposed a sugar tax policy on the food and beverage companies (UNESDA, 2020).

Wellness Movement

Sugar reduction is not the only health related concern of organizations. In 2006, the European commission enacted legislations and standardized labelling as it is considered a powerful tool in communicating with consumers so it is essential to be correct and reliable (European Communities, 2006). Moreover, one of UNESDA main goals is to provide consumers with clear nutrition labeling which is easy to understand and comparable with similar products, this initiative

is part of their support to the healthy lifestyle, the interest of consumers and the purchases of products based on well informed decisions (UNESDA, n.d.).

In addition to the awareness organizations are constantly raising, COVID-19 had a strong impact as it changed people's perspective on old hobbits and shifted their perspective towards wellness and health (Challaghn, Losh, Pione & Teichner, 2021). Thus, consumers started to look for food and beverages that help them accomplish their goals. Nevertheless, the definition of health and wellness varies among people as it ranges from nutritional content to organic ingredients to all-natural elements, so each category varies based on the consumer's consideration (Deloitte, 2015). A recent study conducted by McKenzie illustrates the growth of the wellness industry and the need for companies to develop strategies to respond to this growth (Challaghn, Losh, Pione & Teichner, 2021). Moreover, KPMG insights on top beverages trends in 2020 indicate that consumers are willing to pay more for drinks that have functional benefits and clean ingredients, which is reflected by the constant growth of premium beverages (Colbert, 2020).

In relation to the aforementioned, as consumers prefer beverages free from artificial added flavors and pesticides, the organic beverages market has a projected compound annual growth rate (CAGR) 12.3% during the period of 2020 to 2025. Thus, companies are embracing this trend and are reformulating their existing products or introducing new lines to serve the growing market demand (Mordor intelligence, 2020).

Additionally, COVID-19 slowed the globalization of food to a certain extent and a counter trend is now emerging which is food nationalism (Euromonitor international, 2020). With nowadays people prioritizing health, consumers are looking for trustworthy ingredients with familiar nutritional values. This has served local players as well as many startups as they started developing products with authentic ingredients and brand's philosophy in which the local consumers can relate to (Euromonitor international, 2020).

Fermentation and Enzyme Trends

Fermented drinks market is expected to grow at a CAGR of 6.2% in the next 5 years. This is due to the consciousness among consumers after COVID-19, the demand for healthy sources of hydrations and favoring probiotic drinks due to its relation to immunity boosting (Mordor intelligence, 2020). Moreover, the increasing demand for natural fermented beverages as part of a healthy lifestyle and an all-natural intakes diet (Transparency Market Research, 2021). Consequently, there has been a growing technological development in the production process of fermented products and mergers and acquisitions between manufacturers and supply chain members (Transparency Market Research, 2021).

Enzyme solutions is another beverage related technology that has growing recognition for its significant role in the production process and is expected to grow at a CAGR of 7.1% in the next 7 years (Grand view research, 2020). This forecast is a result of the increasing demand for functional food and beverages products with natural taste and flavor in relation to the increasing health awareness (Grand view research, 2020). Particularly consumers valuing the benefits associated with the use of enzymes such as improving the digestion process, increasing the intake of antioxidants, and enhancing the overall quality of the product (Persistence Market Research, 2019). Moreover, the consumer's awareness and preference for clean label products which are chemical free, alleviated the use of chemical additives towards the adaptation of natural enzymes (Persistence Market Research, 2019). Consequently, there have been more innovative initiatives related to enhancing the taste and texture of drinks using enzyme solutions. All the aforementioned resulted in a significant increase in investment in the biotechnology sector, which is presented by Novozymes, DuPont Danisco, and DSM constituting 75% of the market share (Grand view research, 2020).

4.1.2 Internal R&D and Innovation in the Beverage Industry

Innovation in the internal research and development process of major market players in the beverage industry is a common paradigm that results from the influence of external trends. The Coca Cola Company (2020) through their Transformational Innovation Team rotates different groups of specialists from Research and Development to navigate new territory and to produce beverages in the emerging categories. These emerging categories include cultured ciders, kombuchas, and keto diet smoothies, which are highly associated with previously discussed health trends (The Coca Cola Company, 2020). Another significant player that engages in a variety of internal research and development activities is PepsiCo. These activities mainly consist of innovations that focus on transforming portfolio and creating products that consumers prefer by developing new technologies and ingredients, implementing sugar, sodium, and saturated fat reduction in product improvement, and offering products with positive nutrition (Pepsi Co, 2020). More specific innovations in their R&D department include advantaged plant protein, bio fermentation, enzymatic modification, alternative sweeteners, and sterilization technologies (Kozman, 2017). Additionally, programs such as R&D Fellows Program are utilized in the company to encourage the company's scientists to conduct their own visionary research, such initiatives intend to build best-in- class research and development (Askew, 2021). The R&D specialists are encouraged to either identify or even create future food and beverage trends in the industry. Large and global beverage companies are committed to build and apply nutrition knowledge. Another example is Nestle, the commitments detailed in their Sustainability Report include building biomedical science with the purpose of developing health promoting products and creating personalized nutrition (Nestle, 2020). Nestle is not solely focused on producing nutritious food and beverages, but also enabling innovative science and technology that made such products possible (Nestle, 2020). Additionally, they consider that this effort ensures solid scientific foundations to be prepared for the future of the industry.

4.1.3 External Partnerships and Collaborations in the Beverage Industry

The Coca Cola Company cooperates with peers in the industry to help reduce the intake of added sugars, by participating in sugar reduction initiatives the company expects to meet expectations of consumers in relation to the sugar reduction trend (The Coca Cola Company, 2020). The changes in consumer preferences related to wanting cleaner and healthier beverages influences Coca Cola to increase efforts in finding non-sugar sweeteners. In this area the company has not solely headed to its own lab, but rather recurs to outsourcing R&D by turning to the public. An example is the announcement of a paid challenge calling on scientists and researchers to find sugar alternatives that mimic the sensation of sugar (Sustainable Brands, 2017). Additionally, to offer drinks with nutrition benefits, a common strategy the company uses is partnerships with other companies. For example, the launch of ultra-filtered milk in a partnership with Dairy Farmers of Ontario and the plant-based beverage Avez in collaboration with a Danish startup named Paboco (The Coca Cola Company, 2020).

PepsiCo also acts in response to meet the consumer needs of a balanced and healthy diet, one of the ways is to make acquisitions of brands such as CytoSport, Be & Cherry, Bare, and Kevita (Pepsi Co, 2021). Kevita is especially relevant to the current beverage trends, as it consists of probiotic and kombucha beverages using fermentation processes. Besides acquisitions, there are several examples of partnerships and collaborations that the company is adamant about to achieve their nutrition goals. The Nutrition Greenhouse was launched by Pepsi in 2017 to support nutrition food and beverage entrepreneurs in Europe (Pepsi Co, 2021). This program gives the opportunity for these brands to collaborate with PepsiCo to improve the research process. In India, PepsiCo has collaborated with Tata to create products such as Tata Water Plus that is fortified with bio-available zinc and copper, and Tato Gluco Plus with iron and glucose to provide energy (Pepsi Co, 2021). PepsiCo is viewed as a catalyst for R&D growth in the industry as since 2015 has more than 50 agreements with academic institutions and R&D organizations around the world (Swientek, 2015). Additionally, the company even made publicly available an entire oat genome to encourage the advancement of oat research. To unlock the oat genome sequence, they were collaborating with partners such as Corteva Agri Science (Pepsi Co, 2019). The company is also a founding partner of the European Institute of Innovation and Technology (EIT) Food, which

encompasses more than 50 partners that include universities, businesses, and research centers across Europe with the goal of creating a connected food system for the future (PepsiCo, 2021). Also, by being a member of other organizations such as the International Food and Beverage Alliance, and the International Council of Beverage Associations they help in driving progress on nutrition projects and reformulation of products (Pepsi Co, 2021).

Nestle participates in a variety of partnerships and exemplifies open contribution to the understanding of nutrition. The company shared findings in global conferences and peer reviewed papers (Nestle, 2020). Furthermore, Nestle introduced in 2020 a new patented technology that enriches products with healthy fibers while significantly reducing sugar, it was introduced in Milo Products in Southeast Asia. To encourage collaboration to further the results of research and development, the company has an R&D Accelerator program that brings startups, Nestle scientists and students to collaborate in advancing science and technology to develop innovative systems and products (Nestle, 2019).

Biotechnology firms have become important potential partners in the beverage industry. An example is the Swedish sugar reduction company Bayn, now part of Humble Group AB, that has developed a-sensory technology to analyze the smell of reduced sugar products with the goal of determining how to mimic the taste of sugar foods (Rajan, 2018). Considering the sugar reduction trends, such companies represent high potential for establishing partnership with beverage companies focused on sugar reduction initiatives. Another example is Amai Proteins which produces different types of proteins that reduce the majority of the sugar while maintaining the sensory profile (Amai Proteins, 2018). Sensory evaluation is an important part of food technology that has different applications in the beverage industry. Amai Proteins collaborates with companies such as Ocean Spray and Danone (Amai Proteins, 2018).

Enzyme solutions is another aspect in beverage technology that enables product and process improvements. The consumer preference towards products with more health benefits and nutritional content is fueling the adoption of enzymes (Persistence Market Research, 2021). Additionally, enzymes such as proteases and amylases play a fundamental role in providing more energy and improving digestion, leading to a rise in demand in recent years. Companies such as Amano Enzyme that started a line of non -Gmo food enzymes play an important role as partners

for major market players in the industry. Amano Enzyme is an example of a business constantly expanding into several industries with the goal of using enzymes to improve functionality, taste, and nutrition (Amano Enzyme, 2021).

The collaboration aspect in the industry also entails partnerships between the food and biotechnology firms that provide solutions for the beverage industry. The food tech startup focused on sugar reduction, Better Juice, is committed to transforming the global juice industry which led to a collaboration with Gea Group AG which is a major process engineering firm for the food and beverage sector. (Future Food Tech, 2021). The two companies agreed to work together to construct and implement a sugar reduction innovative solution in orange juice and market such solution globally. Better Juice's technology consists of using all-natural ingredients to convert sucrose, fructose, and glucose into non digestible molecules such as prebiotic dietary fibers (Future Food Tech, 2021). Future Food Tech considers that this collaboration allows a better integration of this enzymatic technology into juice companies that are focused on meeting the trend of sugar reduction.

4.1.4 Capability Development in Beverage Companies

There are several perspectives observed in different companies concerning the development of capabilities that result from internal development and external partnerships. The Coca Cola Company views the Transformational Innovation Team with different specialists as a way to implement frameworks and learnings across the organization that fuels the capability of driving growth (The Coca Cola Company, 2020). Furthermore, one of the primary goals is to create a fast-paced adaptive environment that delivers more disruptive innovation. Other capabilities such as the ability to balance agility, seizing opportunities fast, and embracing iterative processes are considered vital for Coca Cola's innovation success (Crawford, 2020). Coca Cola's CEO considers that to be able to justify investing in research to be innovative, companies must balance the agility to find and experiment, while converging the solutions that generate scale and market share (Crawford, 2020).

PepsiCo also considers fundamental the research and development processes that lead to innovation. The second target of PepsiCo's sustainability strategy encompasses bringing together

operations teams and innovators for internal research and development (Pepsi Co, 2019). R&D centers of PepsiCo all around the world leverage different competencies and capabilities such as consumer insights, engineering knowledge, food science and nutrition (EIT Food, 2021). From the perspective of the Open Innovation and Alliance Management department, PepsiCo also incorporates sensory, clinical science, metabolomics, food safety, agro, and biology knowledge capabilities in their R&D process (Kozman, 2017). The ability to converge technologies is another aspect that is viewed as valuable in the company. Dr. Khan who works for PepsiCo in transforming how R&D approaches research, product development, technology, and nutrition considers that the key is not solely a specific technology because usually it will not completely disrupt by itself, rather is more important for the company to have the ability to converge multiple technologies (Swientik, 2015). Furthermore, to achieve this, the organization has to possess diversity of backgrounds and thinking to be able to recognize patterns that lead to such convergence. Additionally, incorporation of specific areas of expertise such as physiology into the R&D process has a great influence on product development (Swientek, 2015). Through this, consumers are viewed more holistically and the effects of the products on the body now impact how a product is designed and developed. Another example of capabilities in the R&D and innovation processes include Nestle's enhancement of prototyping capabilities to accelerate innovation (Nestle, 2020).

4.2 Primary Data

4.2.1 Beverage Companies' Relationship to External Trends

We began our interviews with the selected beverage firms by asking questions related to considering the external trends as base for production process decisions specifically from the consumers perspective. We received different responses as some companies believed that they are influencing the consumers with their product development strategy. For example, Smakis is still considered the first brand in their category with twice the amount of fruit and was the first with organic and KRAV- labeled (Smakis, n.d.). Moreover, in the interview we conducted with the Founder/ CEO he emphasized on the fact that his company influenced consumers and other competitors and he stated that: *"Smakis was the first brand in Sweden with organic drinks, with*

stevia sweetener, first brand with water and fruits. Other companies have copied, Smakis is the brand that innovates and the rest follow" (Erik Östensson, Smakis).

In comparison, Good Idea Drinks might appear as a brand influenced by the recent wellness trend as the drink is sparkling water which contains ingredients that help balance the blood sugar to maintain natural energy and it has zero carbs (Good Idea Drinks, n.d.). Yet the response of their Chief scientist to that question was not as expected, she stated:

> *"The research started 20 years ago; we are not producing based on trends. This product has been in the making way before the trends. but I think we come from that same background, we know it's beneficial to take care of your blood sugar and we happen to be in an era now where there is big focus on that"* (Elin Östman, Good Idea Drinks).

Therefore, these two companies believe in educating the consumers about specific aspects as part of their commercial efforts. On the other hand, some companies focus mainly on the current customers' trends. For example, Bornholms Mosteri brand's core is to create an authentic experience for customers so it is focused on the taste that customers value (Bornholms Mosteri, n.d.). Additionally in the interview with their CEO/Administrative director, he emphasized on the developing market trends and consumer shift to be a reason to have their own brands and innovation initiatives; thus, he indicated:

> *"External trends are the reason why we are moving in this direction. That people want something that is locally produced with local ingredients, they want low sugar, innovative new stuff, things that they haven't heard of an experience in the drink they order along with their food"* (Nicklas Rathje, Bornholms Mosteri).

Whereas Naturfrisk and Østerberg Foods considered both perspectives by focusing on having an impact on the market while also keeping up with the latest trends. For Naturfrisk the company's unique selling proposition is to provide quality and taste so they focus on the wellness trend and they try to refine their products to deliver the best mix of both taste and health aspects (Naturfrisk,

n.d.). Moreover, the company's CEO Tørk Furhauge considers the aspect of including organic raw materials and the movement of all-natural ingredients in their operations yet they do not view the sugar reduction trend as relevant to them and their target market as they use natural fruit taste. Hence, reducing natural sugar and investing in this kind of technology is not significant from their point of view. Similarly, for Østerberg Foods one of their main values is the health of customers so they do not add refined sugar to their products, yet their innovation strategy is about exploring the world for unique tests and they call it "Taste the World" (Østerberg Foods, n.d.). This was further explained by the company's Head of Product Development as she stressed the importance of keeping up with the latest market trends but also create new ones by innovating products that already exist and present it to the market, so they follow the strategy of internal influences external and vice versa.

> "*To be a leader and have a better contribution in the industry it is important to get inspired by other products to come with new ideas. However, this doesn't mean to copy other companies but the ideas could be utilized in different situations and results in new concepts"* (Cathrine Østerberg, Østerberg Foods).

For the respondents who believed their company's strategy influences the market, they indicated that external trends such as sugar reduction, organic and all-natural ingredients movement impact their production to some extent. However, the degree of influence varies across companies and also depends on government laws. Thus, for Smakis the sugar reduction trend is important considering the sugar tax and that the juices should still taste well:

> "*Sugar reduction is a very important trend to consider because in England and Norway there is sugar legislation, and this might come to Sweden. Sugar makes the taste stronger, and we can't sell if the products don't taste well. Considering that Smakis is also a brand consumed by older people"* (Erik Östensson, Smakis).

Moreover, for the organic trend the respondent perspective is that using organic ingredients is not important for Smakis solely because of the recent trend but since it is healthy for children to consume organic fruits, so it is part of the brand philosophy.

"Health is combined with organic; you want to know that fruits and vegetables your children consume don't have pesticides and are clean from chemicals" (Erik Östensson, Smakis).

As for Good Idea Drinks, they believe that these trends can influence the current production by adding some ingredients and flavors to their existing drinks:

> *"We are looking at what the market is interested in, so there are additions that can be made to our existing concept. We added some ingredients to the American market from the electrolyte and immunity that is very popular right now. We are also looking at other flavors, maybe adding other types, we are also discussing what types of studies make it more relevant in different geographical areas. So, we also do plans for that kind of further"* (Elin Östman, Good Idea Drinks).

On the other hand, Naturfrisk had a different perspective as they saw the current trend matching with their brand perspective however, they viewed other aspects of production as a challenge because not only what we consume is important as fruits are part of a complete ecosystem.

> "*It's easy for us to be part of that health and wellness movement. Three of our soft drinks are made without added sugar, our juices and smoothies are also without added sugar. But, for instance, reducing our CO2 in our facility is a challenge, as we use too much energy because we have very old production units in the brewery"* (Tørk Furhauge, Naturfrisk).

4.2.2 Sustainability aspects

When it comes to protecting the environment and finding sustainable solutions, all the interviewed companies had similar perspectives. They all viewed the sustainable aspect of the production as significant to build their brand and also to show that they are part of the community where they operate. However, there were different foci for companies as some emphasized on the packaging

aspect of sustainability and others on reducing waste and CO2 emissions. For Smakis and Good Idea Drinks they focused on packaging that is easier to recycle with less plastic.

> "*Mostly with beverages and foods, a lot about the reduction of plastic. Those things are more of an issue for the industry to solve, more than lowering of sugar or Ingredients. Because I think that's something everybody is working on all the time"* (Erik Östensson, Smakis).

Bornholms Mosteri focused on the juice production and the raw material side of sustainability.

> *"We are exploring new production process that are both provide good product, sustainable and environment friendly, so we are currently looking for ways to reduce waste by extracting some protein and flavors from fruit that have to go to waste to utilize them and create a valuable product from them" (*Nicklas Rathje, Bornholms Mosteri).

Whereas Naturfrisk had internally developed a new process to reduce CO2 emission in their local production factories "*We had an inventor working with us for one and a half years. And he developed a machinery that can capture the CO2 produced when we produce beer. And reuse it for our soft drink production. When you produce beer, yeast produces CO2, mostly into the air, so this machinery instead we can use it to produce our soft drinks"* (Tørk Furhauge, Naturfrisk). Moreover, they also have environmental considerations that they apply for their raw materials by reducing CO2 emission in their procurement and supply chain.

> "*We have started using raw materials that most of it is locally produced in farms not far away from the brewery. In our Distillery where we produce whiskey. We mainly use local mold. So, using local ingredients is also a trend connected to the environmental movement"* (Tørk Furhauge, Naturfrisk).

4.2.3 Innovation Strategy and Partnerships in Beverage Companies

The companies' innovation strategy and their collaborations initiatives were inquired to explore the relationships between their strategies and capability development we received different views. For example, Smakis had mainly internal innovation processes and they used collaborations with organizations to promote their brand philosophy that focused on anti-bullying and the use of organic ingredients in children's juice. Moreover, their innovation was focused on the packaging and the messages that intended to communicate. Thus, they had collaborations with Friends, an organization which is focused on working against mental illnesses that bullying among kids create (Erik Östensson, Smakis). The Founder positions his brand as one that does not only search for profits but tries to have a positive impact on the community where they operate to fulfill their brand values. Moreover, he considers the aforementioned aspects as the main reason for his company's existence in the market. (Erik Östensson, Smakis)

Additionally, Good Idea Drinks focuses on internal development of their product as they have a strong academic background that allows them to internalize their product development process, however they still have some collaborations with universities and suppliers.

> *"We are PhDs, we are strong academics, we have competence in-house. And we want to fine-tune this concept before we move on to something else. So, we can do quite a lot on our own, when it comes to smaller studies and clinical trials because we have this background. But we collaborate with ingredient providers, flavor house, student/University project development projects*" (Elin Östman, Good Idea Drinks).

However, for this stage they are fixed with their current product because they are still in an early phase where they need to raise awareness about the health properties the drink brings before expanding operations. But in the future, they could consider open innovation

> "*We are rather fixed upon this product, so we won't make new things. Maybe later on we open for other ideas and concepts, but right now we are very stringent with our concept in order for our people to learn about this product. We are not a big*

company that has an open innovation department with many ideas thrown out, we come more from a product specific mindset" (Elin Östman, Good Idea Drinks).

As for Østerberg Foods, they also focused on internal innovation as their strategy focused on coming up with new ideas. Particularly the Head of Product Development Cathrine Østerberg emphasized on the importance of looking at ingredients in other parts of the world and introducing it in unique ways in the markets where the company operates.

As for the other two companies, they considered innovation as a significant part of their product development and emphasized on the role of collaborations in order to achieve their goals and for future development. Particularly, Naturfrisk highlighted the importance of being flexible and that innovation is a cumulative process that grows with the company and every employee in the company can be involved in this aspect.

"*Every year, we try to educate our employees and develop more projects that make us more innovative. I thought how can we compete since we are squeezed in the middle. So I made a strategy that we want to be more flexible than the big ones, produce small batches, we have a smaller assortment that can adapt to consumer needs, we are very fast in developing new things, we want to be more innovative than our equal competitors"* (Tørk Furhauge, Naturfrisk).

One way to achieve more innovation is to collaborate with universities as it is a good way for the company to scientifically test their ideas and their effects in terms of the health characteristics.

"As part of our innovation we are working together with a university to produce a smoothie that can prevent cancer in the digestive system. Next year this smoothie will be tried and then scientists will investigate if it has done any good for them, So, we try to always be part of new. scientific projects like that" (Tørk Furhauge, Naturfrisk).

Moreover, collaborating with competitors is also an important aspect, mainly smaller competitors as they could have mutual projects where they can use the Naturfrisk facility to develop new

products, so it becomes a win-win situation for both companies. These collaborations are not only important from a product development perspective but also to serve as part of the community. Therefore, it is a way to build their brand and reflect the company's values and interest in the health standards in the community where they operate.

As for Bornholms Mosteri they have a relatively similar set up, as the company engages in both internal product development and collaborations with universities. The company does internal research continuously and also started collaborating with the Danish technology university in the food department (Nicklas Rathje, Bornholms Mosteri). The main goals of the university collaboration is to further develop the areas related to reducing waste and finding new unique flavors to serve their customers

> *"The university collaboration focuses on extracting some protein and flavors from fruit that have to go to waste to utilize them and create a valuable product from them. Also new ways of extracting flavors, finding flavors that you weren't able to make previously"* (Nicklas Rathje, Bornholms Mosteri).

The results that come with these projects are significant in forming the company's decisions about future product launching or the path that needs to be taken to have a successful internal development

> *"We always try to go down the path that opens up to us, so it depends on the results. If we find good results in one area, we might become more eager to go in that direction. The Path of least resistance. But innovation is very important in my opinion and is the only way to keep exciting as a company to be innovative but a lot of this knowledge needs to come from the universities"* (Nicklas Rathje, Bornholms Mosteri).

4.2.4 Perspectives on the Opportunities - Collaboration Partners

The following section summarizes the primary findings obtained from the interviews of the enzyme biotechnology firm and the Food Technology Department of Lund University. These findings exemplify the perspective on opportunities for the beverage industry and their corresponding impact from the viewpoint of institutions prevalent in the types of external partnerships beverage companies usually engage in.

Enzyme Technology in the Beverage Industry

The innovation director of the biotechnology firm focused on the specific types of technologies and solutions the company offers to beverage firms, in this case enzymes. The improvement in the use of raw materials through enzyme solutions is considered one of the greatest benefits for beverages, mainly in juices. Enzymes also contribute to efficient processing and product variety. When referring to the fundamental role of enzymes in the industry, she claimed that:

"Without enzymes, there wouldn't have been a juice industry and product variety like we have today" (Anonymous 1).

The primary clients of this biotech firm are generally large factories that are producing fruit or juice concentrate that will be sold to beverage companies. However, their collaboration partners also include startups and smaller companies that are more likely not to be using enzymes on a large scale as larger companies do. In this case, the biotech firm tailors solutions to their needs, works together with them to propose a solution on how they could improve through the use of enzymes both in the content of their products and in environmental factors such as improving energy consumption and reducing waste. However, in certain cases when smaller companies want to apply specific enzymes to each fruit type in their products, the application of enzymes cannot be tailored to each individual product and the best solution is to provide general enzymes that can still bring benefits to all products. Aside from the business relationship with factories and companies, the firm also collaborates with other institutions in research and development. Even though they have the resources and capabilities for their fundamental internal R&D, certain specialty projects are done in collaboration with universities and with companies in the industry (Anonymous 1).

Lastly, from the biotech's innovation department perspective, enzyme solutions highly align with the environmental trends in the market, the plant protein initiatives, and the sugar reduction movement. Concerning sugar reduction, she expressed the following:

> *"Enzymes play a key role in the making of raw materials for replacements of sugar, in research labs of different companies we know that solutions are being worked on"* (Anonymous 1).

Other Technology Opportunities for the Beverage Industry

According to the director of Lund University's Food Technology and Nutrition Department, certain aspects of current research align with the increasing trends of digestive health and nutrition. For example, a prevalent research component is the nutritional properties of oats in drinks and beverages. Additionally, the investigation of the lipid profile of these types of drinks and the effects on the metabolism such as glucose and insulin responses of the body. Other technologies such as enzymes and fermentation are areas that have been researched and implemented by the industry for many years but are constantly evolving. As the focus on health increases in the industry, technologies get better and more specialized as a response to providing the necessary solutions for companies. In relation to the sugar reduction trend, the university is not actively doing research on sugar substitution as Granfeldt considers that most beverage companies are focused on the ingredients and the taste in relation to sugar substitution, rather than research on the nutritional value of the product and the effects on the body. In the case of the university's department, the primary focus currently is metabolism processes. The interesting project of Good Idea Drinks was discussed, which is a beverage intended to be taken before a meal to decrease glucose and insulin responses after the meal in the body. She considers this product the beginning of future applications of beverages in a direct relation to health issues. She stated the following perspective on possibilities for the future:

> *"Drinks are easy to take, therefore in the future we might see other products similar to Good Idea, for example for high blood pressure you take a juice that contributes to lowering it, instead of a pill. Also, to increase calcium uptake, iron, and others"* (Yvonne Granfeldt, Lund University).

Collaborations continue to be a prevalent contributing factor to the advancement of research from the university's perspective as well. For example, Lund University's partnership with EIT Food gives entrance to big companies and other universities that are focused on food research. Since an initiative like EIT Food is not focused on the research itself rather the collaborations with the companies in the industry and the challenges they have, universities play an important role to improve the research aspect of the future of food and beverages.

"EIT Food is an initiative that focuses on What is the future for the companies? To move forwards, they need the universities for knowledge" (Yvonne Granfeldt, Lund University).

4.2.5 Capabilities in Beverage Companies

Capabilities as Factors of Influence

Overall, the respondents did not focus on specific capabilities that develop as a result of using external partnerships and/or internal development as modes of implementation for capability development. It was more common to obtain insights on how existing capabilities influenced the decisions made in regard to the implementation methods, meaning capabilities were viewed by the experts as not solely possible results of the processes, but also as factors that contributed to their innovation strategy. The capability to adapt was a prevalent factor behind company's reasoning to seek innovation knowledge outside their internal research departments. Another important component was the ability to sense the customer needs in the market. For example, the CEO of beverage company Bornholms Mosteri considers that due to certain characteristics they possess such as constantly being customer oriented and being observant of consumer behavior, leads them to develop technological innovation through partnerships such as universities. This contributes to expanding knowledge on the specific research needed to create innovative products the customer desires. The company also focuses on the entrepreneurial mindset in employees as a capability that pushes the innovation drive to create new products that people will like. However, there are risks that accompany constantly seeking to innovate when certain organic or health-oriented products are too different from what people are accustomed to. Rathje states that:

> *"There is always a risk to move away from something that the people like, for example the shift from regular orange juice to other organic beverages. You don't know what you are going to get as a response"* (Nicklas Rathje, Bornholms Mosteri).

Capabilities as Consequences of Innovation

The CEO of Naturfrisk expressed more specific determinant factors of their strategy that led to capability development in comparison to the rest of the companies. The size of their company and the vision to be flexible are considered context characteristics that have led to their involvement in organic societies, collaborations with universities, and providing opportunities for smaller companies in their facilities. He views the company as being in between small breweries and beverage producers, and the larger market players. As a result, this enhances their flexibility to work internally on new products but also being open to collaborations. Additionally, having three different categories of drinks is considered a major advantage in comparison to competitors that solely produce alcoholic drinks or soft drinks, while they are able to do both. The entrepreneurial mindset to try new solutions and empowerment to make decisions is also considered an important capability developed over the years as the company acquires more knowledge. This aspect was a common theme among interviewees, since most agreed that creating an organizational culture where the different people involved in the innovation processes are constantly open to experiment is crucial. Furhuage claims that:

> *"when there is an entrepreneurial mindset, you try things, you are flexible, when a company grows if there is a lack of this, it prevents innovation and making fast paced decisions"* (Tørk Furhauge, Naturfrisk).

The growth of Naturfrisk that has resulted from seeking new opportunities and pursuing their current strategy has impacted knowledge growth in other aspects such as the ability to secure high quality production. Furhuage considers that as the company pools knowledge from other collaborations, all departments involved are impacted in a positive way especially considering the size of the company that allows for direct communication concerning new initiatives from top management to the employees. Additionally, he believes the capabilities developed contribute to

the company being on the right track as they are getting a positive response from both consumers and customers. In relation to this, he considers that ultimately it is more important to have a strong influence on the consumers rather than the businesses that buy their products. By innovating products for health minded customers that want organic and nutritious beverages, this is achieved. The ability to understand how your product relates to the outside market and your target customers was also a prevalent aspect discussed by Elin Östman, Chief Scientific Officer of Good Idea Drinks. Considering their product is still in the early stages of adoption, they consider fundamental to teach the customers to understand it and have previous knowledge related to which markets should be targeted as the concept grows.

4.2.6 Chapter Summary

The industry background secondary research included information about external trends, internal development, external partnerships, and capabilities to complement the findings of the primary data. The first insights of the primary data encompass the relationship between the company's actions and external trends, it showcases that the relation is not necessarily viewed by companies as external trends influencing the research and development process. Rather, in certain cases, a company can be the innovator and initiator of a trend, causing the inside to influence the external business environment. Furthermore, findings on the implementation modes of capability development and technology opportunities for the industry from both the beverage and collaboration partners perspective was included to provide two different viewpoints when analyzing this aspect of the framework in the analysis. Lastly, different factors related to capabilities and their development in beverage companies is included, which complemented with the previously mentioned insights play a vital role in the following analysis section.

5. Analysis & Discussion

This section presents the analysis of the patterns observed in the empirical data and the effects of these findings on the preliminary framework. The information we had from the interviews led to revisions in the preliminary framework by discovering some further insights. The perspectives of the companies interviewed indicated that the internal capability development could also affect the external trends and might lead the market to adapt to a company's innovative ideas. Additionally, we found the main factors that could influence a company's decision on internal development or external partnerships is the firm's own assessment of their current capability. Lastly, the type of capability development strategy does not lead to ultimate sustainable competitive advantages or partial development, yet it leads to capability enhancement as this process is cumulative overtime. Thus, we eliminated the competitive advantage aspect considering it was hard to evaluate it correctly since each company had a different target market and different brand philosophy. The final framework is presented below highlighting the changes introduced to the preliminary framework, this structure will be used as the basis of our data analysis discussion.

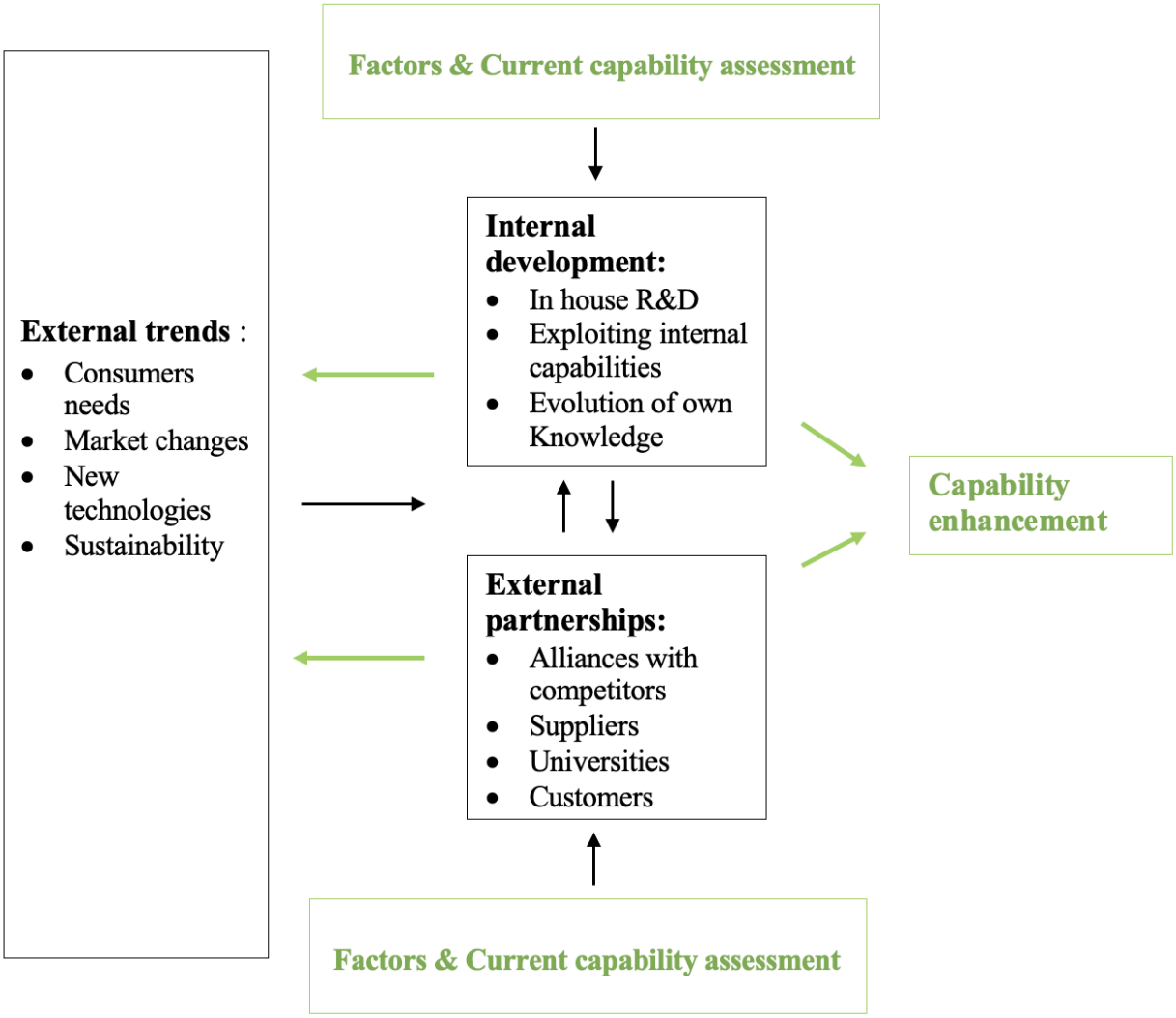

Figure 2. Final Framework

5.1 The influence of external trends

The primary data we collected with regards to the external data aligns with the Academic research discussed in the literature review. As previously suggested, the trends defined by customer's needs and wants are highly related to the commercial success of companies (Poudel, Carter, & Lonial, 2018). Moreover, more than 50% of innovation is a consequence of identifying a market need, with the majority being improvement of existing processes and technologies (Foden,1989). Consumers seeking uniqueness and demanding to be involved in the different stages of the production process pushed firms to make changes in their business model patterns to react to different emerging trends (Arenas-Jal et al. 2019). The companies interviewed supported the aforementioned and indicated that their strategy and product development process is highly associated with the current market trends. The influence of these trends was highly emphasized in the industry background by witnessing the expected growing organic beverages market and low sugar drinks. Moreover, an important success factor in the capability development is the ability of a firm to adapt to changes in the business environment and market and make assumptions about external technological opportunities related to consumer's preferences (Teece, 2017). This further explains the actions of companies to further explore and invest heavily in processes and technologies such as fermentation and enzymes. Technological preparedness is desired, however, not all firms are able to respond adequately, especially small and medium sized enterprises as they have restricted resources in comparison to companies with large R&D budget (Savioz & Blum, 2002). Consequently, companies reacted to market trends differently depending on their current assessment. The research focused on the trends and aspects related to health, consumer's needs and company's capabilities, yet in the primary data the aspect on environmental sustainability kept being prevalent as part of the CSR initiatives the companies had and their impact on society. This aspect was not particularly discussed in detail in theoretical research, yet it is considered an important aspect in the product development activities companies conduct. It is important to mention that for the environmental aspect, consideration was also given to law and legislation and not evaluated only from a brand's perspective.

5.2 On-going research and new trends

A significant aspect which was considered a discrepancy in our preliminary framework is the influence of internal R&D initiatives on the external market. In the primary data we saw this aspect specifically with Good Idea Drinks as they were not following a trend rather creating one by educating people on their drink properties. Thus, they were influencing people's choices and mindset by their products. For a small company to apply this strategy it means heavy investment in R&D. Thus, the fact that the idea of this drink was firstly developed in a university as a food science project that took twenty years to have the concept ready makes it an exception that cannot be generalized to all startups. However, for big companies as indicated in the industry background they are heavily investing in finding alternatives to sugars and sweaters such as Pepsi. While others are looking into creating personalized nutrition such as Nestle. These big players have the capability for such research, and they can also be accelerators and incubators for other companies which are working in these areas to create new trends. We saw in the industry background research that the Coca Cola Company is conducting this strategy through their open innovation approach. PepsiCo also followed this strategy by making an oat genome research public to advance the exploration in that direction. Thus, the initiatives of big players and the open innovation strategy is creating new trends. This is done by taking the first step in guiding customers and other players to take a certain road and become more interested in new topics and this leads to eventually creating new trends. The evidence from the empirical findings associated and explores further Pisano, Piranto and Rieple's (2015) research which defines trends as features where stakeholders and partners work together to create customized products or services. In this case, companies that innovate with the intention of setting new trends for the industry play a role in this process and also by seeking collaborations might further influence the market. Based on the aforementioned, we modified the preliminary framework to include the company's internal capability development and external partnerships as sources that contribute to the emerging new trends which have the ability to grow and eventually shift perspectives of the entire industry.

5.3 Assessment of Current Capabilities

The evaluation of current capabilities was perceived by the experts in the interview data as an influential factor towards choosing their internal or external development strategy. Rather than considering capabilities as solely a result of these implementation modes, a causation relationship with the assessment of current capabilities as a main driver is evaluated in this present section. Through the empirical findings of companies such as Good Idea Drinks who consider having competent research capabilities enhanced by highly educated professionals in the field as a reason why at this moment less partnerships are needed. As suggested by Capron and Mitchell (2009), assessing the current capabilities and their corresponding constraints or advantages is expected to contribute to developing capabilities when choosing which implementation path to take. One of the aspects expected to be expanded in this study was understanding which conditions and characteristics of the company were more appropriate when developing either implementation mode or combining it. Based on the interview data, it is confirmed that a vital contributing component is the context within the existing capabilities, not solely other organizational factors, and characteristics. The types of capabilities that each firm had varied therefore it is important to address that this influences the different potential capabilities they enhance even though they share types of external partnerships such as universities. As suggested by Rockart and Du (2013), it is important to evaluate as researchers when firms approach different potential capabilities. Based on the case results of the present study, a main condition towards properly evaluating is the knowledge of how current capabilities determine decisions of external sourcing or not. When exploring the steps to decide on how to approach capability development, most of the firms struggled with stating other areas besides their current capabilities that determine the approach to external partnerships for example. This specific point also led to the interpretation that the challenge to distinguish between conditions that align with internal development and external partnerships is because implicitly they assess current capabilities depending on a specific upcoming project or the current circumstances. Due to this, the study shifts some components of the initial framework into a structure that emphasizes that capabilities are both present before making decisions of knowledge acquisition and after such implementation in the form of enhanced capabilities. Current capabilities that were highly prevalent in both secondary and primary findings include the following: *abilities to sense external market factors and trends, seizing opportunities,*

professional knowledge in food /beverage technology research, and the ability to converge different knowledge and technologies. In relation to such, Gamorra and Zawislak (2013) define several types of capabilities including *absorptive*, *dynamic*, and *technological capabilitie*s. These three were further explored in the theoretical research of the study and align with the prevalent capabilities mentioned by interviewees. For example, in the case of absorptive capability defined by Cohen and Levinthal (1990) as being able to distinguish the importance of new information and integrate it in a way that enhances the firm's innovation capabilities. As expressed by the CEO of one of the companies interviewed Bornholms Mosteri, their continuous intention is to look for what can bring good results for the company, when they determine a relevant opportunity in the outside to innovate, they are eager to head in that direction. In order for firms to accurately make decisions concerning the influence of external knowledge on results, having an absorptive capability to differentiate if the direction taken can adequately be integrated is vital. This is also connected to sensing and seizing capabilities stated by companies as important to obtain insights for product improvement that adapts to consumer needs. Dynamic capabilities can be linked to the ability to converge different knowledge and technologies, while technological capabilities are highly associated with the findings that emphasized internal food tech professional knowledge and expert scientists.

Lastly, along with current capability assessment there were other factors identified as possible determinants of knowledge implementation decisions. These include the following: *the size of companies, the extent of their vision towards flexibility and adaptation, the current market adoption of their products, and an entrepreneurial mindset within the organizatio*n. CEO of Naturfrisk emphasized in various of his answers regarding capability development that as the company grew it was fundamental for the teams to possess an entrepreneurial and flexible mindset that allowed the openness to assess knowledge within and outside the company. In the case of Good Idea Drinks, the company is assessing the adoption in different markets of this specific concept product and aligns its path towards obtaining knowledge accordingly. As suggested by Capron and Mitchel (2009), firms are more likely to survive when considering their current capabilities and other internal factors on decisions concerning external sourcing and internal development.

5.4 Internal Development and Partnerships

The interview data regarding the strategies and implementation modes of capability development showcased a prevalence in companies using a combination of both internal development and external partnerships. This aspect aligns with Su, Tsang, and Peng's (2008), argument that internal capabilities establish the foundation to identify and explore the external opportunities, which results in the combination of both causing a greater impact on the firm's innovation. The companies emphasized the importance of collaborations to develop new ideas and adapt to consumer needs. This is highly related with previous theoretical research such as Brunswicker's and Vanhaverbeke's (2014) discussion of external partnerships shaping the performance of companies by offering the opportunity to explore and gain knowledge. Even though some interviewed firms have strong existing research capabilities and expert professionals, acquiring more knowledge is prevalently viewed as an additional advantage that can be obtained through partnerships mainly with universities, industry associations, and competitors. Sabidussi et al's (2014) research also shares a correlation with these findings since their argument focuses on external knowledge complementing internal research and development to contribute to a better innovative performance. The decision of internal development and external partnerships is influenced by current capabilities as discussed in the previous section, in relation to this argument it is important to consider that previous evidence also suggested that the higher the internal capabilities of the firm, the higher the effect of external knowledge (Alvarez and Iske, 2015). In alignment with the empirical results, the respondents also appear to perceive that in order to gain better benefits from the external partnerships they first had to develop strong internal development. There was no disregard of their own abilities and research capabilities even in the smaller firms. On the contrary, firms such as Good Idea, despite their product being developed alongside Lund University, consider their own research capability as the core driver of their product at this current stage. This can be interpreted as the recognition of the firms that the complementation of these two modes is crucial.

Additionally, the types of partnerships that held greater importance and beneficial contributions to the companies interviewed are along the same line of research done by Chen, Vahaverbake, and Du (2015), which states that universities are one of the types of collaboration that have stronger

effects on performance. Collaboration with different types of external partners also has a higher positive impact, this characteristic was also highly emphasized in the empirical data as most companies did not maintain a single type of partnership but rather a combination of different actors in the industry.

In comparison to secondary data that primarily focused on larger market players, there is a visible contrast in the form of combining the external and internal development. The interview data which consists of small and medium size beverage companies, combines both without engaging in an open innovation strategy. The firms make specific decisions on what partnerships deem beneficial for their innovation efforts according to their current needs and projects. However, they are not openly sharing their own research or publicly searching for partnerships. On the other hand, companies like PepsiCo, The Coca Cola Company and Nestle due to their size and influence in the industry have the ability to use open innovation strategies. Some examples such as PepsiCo's public sharing of an oat genome and Coca Cola's challenge for scientists were stated in the industry background empirical findings. This comparison provides an overall perspective that the combination of these implementations is considered important without the size and type of company in the beverage industry being an influential factor, but the specific strategy (open innovation or not) does vary depending on the characteristics of the firm and current capabilities. This contrast aligns with one of the previous arguments leading to the problem statement of the thesis, in which open innovation is viewed as a strategy not applicable to all firms due to hindrances and challenges that accompany it. According to West and Gallagher (2006), the costs of open innovation can be influenced by restrictions of the external flow of knowledge in the market. While this can certainly be applicable, based on the empirical findings there are more factors that associate with open innovation such the firm's position in the market and the ability to incur costs and risks associated with this strategy also playing a role that can be complementary to the types of challenges expressed in previous research.

Lastly, after the exploration of internal development and external partnerships, there is no clear evidence in the aspect of separation between them in the capability development process. As a contrast to research that emphasized the benefits of one over the other such as Carayannopoulous and Auste (2009) who consider that crucial knowledge is always outside the boundaries of companies. The interview data showed that this process is constantly changing and most of the

companies that were mainly focused on the internal aspects, acknowledged that in the future they are open to change their approach and seek external partnerships depending on upcoming projects. Therefore, depending on the factors of influence and capability assessment discussed in the previous section, choices can be made but the end result is not necessarily different in the form that internal development is partially efficient for capability development and that external partnerships lead to a complete capability process. As presented in the final framework, both implementation modes have the ability to lead to capability enhancement. Capability enhancement as the final result of the process for the modified framework is explored in the next section.

5.5 Capability Enhancement

The relationship between current capability assessment and the implementation of internal development, with or without external partnerships as a complement led to the final modifications of the preliminary framework to the final framework. As a result, the final result was no longer the correlation between the implementation modes to competitive advantage, but rather to capability enhancement. The process was evidenced to be constantly evolving, since the firms from the interview data consider their core internal capabilities before evaluating decisions concerning internal or external knowledge development. For example, adaptive and innovative capabilities already existing in companies were considered by the experts to influence seeking outside knowledge. Drawing from secondary research, large market players such as The Coca Cola Company emphasize in their reports the presence of innovation teams that fuel capabilities driving growth. When such companies pool from outside knowledge, a pattern of capability enhancement is also observed. Innovative capability is an important component of alliances and collaborations as suggested by Hagedoorn and Dyusters (2002). In relation to the findings, when a company considers this capability as a part of the core development by seeking external knowledge it can be interpreted that they seek to enhance the current capability. Additionally, this evidence shows a higher correlation of enhancing current capabilities through the combination of internal development and external partnerships, rather than stating these implementations directly led to a competitive advantage. There is a clear hindrance in defining the capability development process as a linear “road” that ends with a company obtaining a complete process because due to ongoing changes and evolving decisions this might not always be the case. Therefore, it deems more

appropriate to present and interpret the framework as a process that does not end in a completion of capability development, but rather in a *constant cycle of capability enhancement*. In alignment with this argument, Teece (2016) suggests that the capability development road can refer to both enhancing an existing one or creating a new one. The interview data showcased a constant pattern of firms making decisions with the purpose of enhancing the current ones, and as a result this method of sustaining competitiveness is considered the possible continuous consequence of internal development and external partnerships.

Another aspect that contributes to the cycle of capability enhancement is the research that supports that not all capabilities follow the same patterns of foundation, development, and maturity. As suggested by Helfat and Margaret (2003), certain capabilities can be transformed through external sources to a better version of its initial components. Consequently, through adaptation and learning from the external, capabilities have the potential to constantly change. However, it is important to consider that since all the companies did not state that the external partnerships they sought had the purpose of creating new capabilities, there might be a bias present. The type of bias is that companies might have the tendency to focus solely on their core competencies and have a narrow view of other aspects that can be incorporated, as suggested by Leonard-Barton (1992). For example, one of the companies associates a positive response from customers with the success of the current capabilities. However, solely because customers are satisfied with the current end product does not necessarily signify that there is no large improvement to be implemented concerning capabilities. Considering there is a high variety of types of capabilities not every single one is linked to the production and sales process. For example, PepsiCo incorporates specific expertise capabilities such as physiology knowledge that might not seem relevant for research and development in an obvious way, however such implementation leads to acquiring a holistic perspective in product development. As suggested by Lenz (1980) the competences of strategic capabilities encompass actions that affect long-term growth, which strengthens the reasoning that the current product acceptance is not sufficient to consider capabilities to be mature and competitive for the long term.

To finalize the overview of capability enhancement, it is important to comprehend the reasoning behind not linking capability transformation to sustainable competitive advantage as done in the preliminary framework. Through the observation and analysis of the primary empirical data, all

the companies considered their business was doing “well” but there was not enough information from their responses concerning the overall picture of their position in the market and competitors. Considering most of them were focused on organic oriented products or a specific new concept such as Good Idea Drinks, establishing the link to the achievement of a sustainable competitive advantage would have been set as an assumption rather than evidenced by the empirical findings. As suggested by Carayannopolous and Auster (2009), though firms are pressured to access external knowledge, there are many cases in which such partnerships fail to contribute to a competitive advantage. Under this consideration, capability enhancement became the final focus as it aligns as a result of internal development and external partnerships through the evidence of the findings.

5.6 Chapter Summary

The two different perspectives of external trends and the corresponding connection to capability implementations provide a comparison of how this relationship is not necessarily fixed and evolves according to varied factors. Companies can be the initial drivers of external trends and through their internal initiatives that progressively influence the market, firms can be viewed as starting points of technologies and innovations. On the other hand, external trends such as sugar reduction and other health trends relevant to this research’s particular cases also have the ability to influence the decisions and actions taken by firm. Thus, the relationship between the external trend component and the firm’s decisions to internally and/or externally acquire knowledge is two edged, working both ways. Among the external trends discussed, the sustainability aspect was included even though initially it did not hold a strong focus on the sub objectives of the research concerning the empirical intentions, all of the interview data pointed to this aspect being highly relevant for the beverage industry.

The overarching analysis of the capability development was explored through a walkthrough of the components that led the direction of the final framework. Firstly, with an overview of the assessment of current capabilities being a major factor and influential driver of the decisions regarding internal development and external partnerships. The current state of capabilities as perceived by the firms’ experts continued throughout the findings to be prevalent as directly related to the innovation strategy concerning the combination or separation of implementations modes. In

this section, the relevant previous research that aligned with establishing this component as a vital factor was also discussed. Additionally, other factors and context characteristics of the company were included to comprehend holistically the core aspect of the framework that leads to capability enhancement.

Following the capability assessment section, more details of internal development, external partnerships, and open innovation strategies were explored through a comparison of primary and secondary data findings. The main details include the benefits of collaboration, the combination with internal capability assessment and the advantages of different types of partnerships. These aspects directly align with the initial theoretical research that emphasized the positive results of incorporating such components into a firm's strategy. Another relevant conclusion was the difference between the smaller firms in the interview data in comparison to large market players when it came to open innovation.

To finalize this chapter, the reasoning of capability enhancement as the last portion of the final framework was discussed. The correlation of obtaining knowledge through either implementation mode with the objective of a sustainable competitive advantage was disregarded as a point that needed further research and evaluation of the market situation of primary empirical data. This aspect is discussed also through comparing previous theoretical research that supports the ongoing transformation and enhancement of capabilities as an ongoing process resulting from strategies such as obtaining external knowledge. Therefore, capability enhancement is considered a more valid result of the previous dynamics in the framework (external trends, capability assessment, and implementation modes) for this study.

6. Conclusion

6.1 Research Purpose and Objectives

The purpose of this study was to provide insights on the two forms of capability development as ways to overcome constraints and have a holistic overview on the outcomes of the corresponding decision. Additionally, to expand on the theory of capability development by comparing the perspective of companies operating in the beverage industry on the internal development of capabilities, external partnerships implementation or the mix of these two strategies. Eventually, to identify the best method that would enhance the success of the capability development process. To achieve this aim we had three sub objectives which we considered as highly relevant in building our preliminary framework and they are discussed below.

The first aspect used as the base of our preliminary framework is the external trends which includes market changes and related new technologies, and the impact it has on companies; thus, we had the following sub objective:

- *Identify the relevant technologies that currently influence nutritional sustainability in the beverage industry.*

This was examined by conducting a thorough research on the industry's recent news and the current nutritional trends that influence beverage companies. Moreover, asking specific questions to the interviewed respondents with respect to the latest consumer's trends. We reached the conclusion that the most influential technologies are the ones related to health and wellness such as fermentation and enzyme solutions and investment in developing sugar alternatives.

The second question was related to the capabilities resulting from the two modes of capability development, whether in internal development, external partnerships or a combination of both,

illustrated in the middle part of our preliminary framework and related to the following corresponding sub objective below:

- *Identify types of capabilities being developed as a response to the external technology opportunities and trends in the industry.*

For this question, a similar method was used by exploring the big players strategy which was mainly identified as open innovation to develop new products. On the other hand, the smaller companies preferred different capability development strategies. Particularly, the companies we interviewed were leaning more to internal development of technologies or engage in research by collaborating with universities to develop products that have sophisticated health implementation. However, there was no clear differentiation between a preference of internal development and external partnerships as a set strategy as the companies interviewed were open for future collaborations depending on the context.

Lastly our preliminary framework intended to provide an overview on the competitive advantage the mode of capability development would have on the company. Additionally, to identify the factors that come along with such a decision. Hence, we had the following subjective:

- *Provide further insights for the framework concerning the impact of external partnerships in capability development in comparison to internal development.*

The preliminary framework which was derived from previous studies and research on capability development had modifications as a result of the empirical data. Specifically, the effect of a company's internal development on emerging new trends which is an important aspect that was incorporated into the final framework. In addition to the enhancement of current capabilities by utilizing the two modes of capability development rather than directly leading to competitive advantages over other competitors. These two aspects were the main changes of our preliminary framework compared to the final one.

Consequently, answering the aforementioned sub-objectives contributed to refining our preliminary framework and achieving the intended goals of this paper.

6.2 Theoretical Implications

The outcomes of this research have several inferences on the capability development theories. For example, Helfat (2000) explores that change in firms can be restricted by initial capabilities and accumulated knowledge base. Whereas in our research we discovered that the process company's take to develop their capability changes frequently and the senior management are open to adjust their approach depending on the project type and objectives. Additionally, the notion that organizations cannot depend only on internal sourcing of ideas even if they have active internal innovation suggested by Rigby and Zook (2002) was challenged. Since sole internal sourcing of ideas could also work and lead to success depending on the concept and the product properties and this was mainly recognized in the primary findings of Good Idea Drinks capability strategy. Moreover, Capron & Mitchell (2009) wanted to explore whether the selection of one of the modes, internal or external, of capability development could lead to the survival of firms in dynamic environments. And we found that there was no clear separation of these two modes of capability development and companies were open to both. Whereas Cassiman & Veugelers, (2006) concluded that success does not depend on the mode of implementation but rather on creating the right context and they suggested future research on factors that affect this process. Their conclusion resonates with the responses we collected from companies as they believe each project could require a different implementation mode, therefore it depends on the company's current assessment of their capability. Moreover, we identified some factors that contribute to the decision on the type of mode implementation such as the type of product the company offers, the size, current market adoption of their offered products and the founder's vision of his company. Consequently, this would lead to constant capability enhancement rather than having ultimate competitive advantages over other firms. The aforementioned findings contributed to adjusting our preliminary framework that was based on previous academic studies. The results of this thesis are relevant to other studies as they can be utilized by researchers or companies under the premises that this was conducted primarily on beverage firms in European market during COVID-19 pandemic in the year of 2021.

6.3 Practical Implications

The insights and conclusions that resulted from the present study can be useful for practitioners. The first aspect deemed as contributing is the ability of companies to not solely be influenced by external trends, but through their internal development research incorporate innovations that set trends to the outside market. The bilateral relationship between external trends and internal capability development showcases the potential benefits that innovation and research departments in firms can obtain from both sensing the outside market and taking risks to create new trends. The combination of the flexibility to adapt to external influences but also maintain an entrepreneurial mindset and capabilities that lead to opportunities that drive initial change in an industry can be a great combination for the long-term survival of the firm. Additionally, CEOs and managers that have the task of making decisions concerning internal development and potential collaborations can benefit from understanding the importance of current capability assessment. Being aware of the need for new capabilities or the current potential ones that can be enhanced can contribute to making decisions concerning capability implementation modes that yield better results. The present acceptance of products in the market can contribute to companies only evaluating short term results. Therefore, it is important to constantly evaluate the whole range of capabilities with the potential to be improved to greater internal investments in development or with external partnerships. Lastly, since the empirical study focused on the beverage industry, companies driven by an innovation strategy in this particular industry can benefit from gaining different perspectives on the relevant technologies and solutions discussed. For example, technologies and trends related to enzyme solutions, organic beverages, and sugar/glucose balance initiatives.

6.4 Limitations and Future Research

While several findings were identified throughout the study that have theoretical and practical implications, there are certain limitations that should be addressed. The first is in relation to the types of companies used for the primary data collection, as initially the intention was to focus on obtaining data from firms that were utilizing specialized technologies to gain a deeper insight of the correlation between external trends and breakthrough capabilities. However, the actual scope was affected by the limited time frame of the study in which there was difficulty establishing contact with the majority of the companies intended, therefore the number of respondents was limited. While the collected data was able to provide further insights on the theoretical framework of the study, it is considered that a larger number of companies with a further range of technology solutions being utilized would have contributed more thoroughly to the practical implications for the beverage industry. The generalization of the findings to different markets globally is also limited since all the companies represented were from a geographical market characterized by emphasizing the importance of certain external trends. Therefore, the connections established might not be applicable to an entire extent to other markets or other industries. In relation to this, it appears recommendable for future research to test the final framework proposed in this study in different industries and geographical markets to gain more detailed insight of its applicability in the overall business environment. By doing so, it can be proven whether the relationships established in the framework are bound to the specific industry or can be further generalized. Another aspect that can be explored is the level of impact of the other factors besides current capability assessment that influence internal development and external partnerships decisions. Past studies address the importance of contextual factors of the companies to make such decisions but lack specifications of which components should be considered. Following that parameter, the present study provided some examples of factors of influence, however considering the empirical data is based on a small number of companies, further research is suggested to examine the relevance of these factors at a larger scale. To finalize, in order to improve the framework into a better conclusive result that ties capability enhancement to the long- term competitive advantage of the firm as originally intended, it is suggested to implement a study incorporating the connection between enhancing capabilities and the competitive position of the firms being investigated.

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8. Appendix A

8.1 Questions for LU food department

In terms of the nutrition trend, which is also one of the research aspects of the department, which specific components you would consider are more significant currently? (ex: digestive health, undernutrition, sugar reduction)

- When we looked at the department's research overview, we came across membrane technology for liquid foods, which is also a tech we read about in our initial research. Would you say this technology is at a point where food & beverage companies are adopting it or still in earlier phases of development, and more future looking?

- Other prevalent technologies we had come across (are there any of these are of particularly important in the department's research)
    - ➢ Nanotechnology – Biosensors, nanofibers
    - ➢ E-sensory tech
    - ➢ Sugar detection methods
    - ➢ Fermentation
    - ➢ Enzymes in Food and Beverage Production
    - ➢ Ultra- sound assisted extraction
    - ➢ Membrane Filtration Processes

- Are there other specific technologies you consider we should conduct desk research on that we have not yet identified?

- In collaborations such as with EIT Food, what do you consider the main drivers of nutrition trends in such initiatives, are there differences in the perspectives of how to approach technology research as opposed to a university's food tech department?

- Are there any specific projects under the EIT Food initiative related to tech for the beverage industry that might be of value to explore in more detail?

    - For example, we stumble upon their partnerships with Doux Matok and Amai Proteins related to sugar reduction/substitution, in the department' research is sugar reduction a prevalent trend?

- Of the technologies discussed that are relevant right now for the department's research, which ones are more likely to be adapted by companies in the short-term span 5 years) and which ones are much more futuristic (10 years or more)?

- The beverage industry encompasses several types of products (soft drinks, juices, energy drinks, sports drinks), is current research geared towards specific types of beverages or can most technologies be applicable to different types?

8.2 Questions for Smakis, Naturfrisk, Bornholms Mosteri, and Østerberg Foods

- Is it ok to record this interview and use the name of the company and yourself in our research?
- Are there any types of technologies or specific solutions besides the organic ingredients being used for the production of organic beverages?
- What external market and sustainability trends currently influence the company's strategy?
- What are the greatest challenges of responding to such trends?
- Is there a current innovation strategy for capability development and what does it entail (open innovation, internal R&D investments, external partnerships, etc)?

  *If it is external, what types of collaborations are being made (universities, biotech, competitors, etc)
- What factors determine this strategy , do you believe certain characteristics or context within the company determine it?
- What are the steps taken to make decisions on the type of strategy for technological innovation (whether to do external sourcing or internal development)?
- Does this strategy impact development of specific capabilities and business competencies, if so what are they?
- What are the risks of this current strategy, do you view in the future a change in the approach of capability development implementation?
- Do you view the current approach to capability development as an influential component to achieve a competitive advantage in the industry?
- What are the most relevant future opportunities in technology for beverage nutrition or the push for organic beverages from your perspective?

8.3 Questions for Good Idea Drinks

- Is it ok to record this interview and use the name of the company and yourself in our research?

- Were there any specific types of technologies or research besides the ingredients that were used in the development of Good Idea Drinks?

- What external market and sustainability trends currently influence the company's products and strategy?

- What are the greatest challenges of responding to such trends?

- Is there a current innovation strategy for capability development and enhancing product development, what does it entail (open innovation, internal R&D investments, external partnerships, etc)?
  *If it is external, what types of collaborations are being made (universities, biotech, competitors,etc)

- What factors determine this strategy, do you believe certain characteristics or context within the company determine it?

- What are the steps taken to make decisions on the type of strategy for technological innovation (whether to do external sourcing or internal development)?

- Does this strategy impact development of specific capabilities and business competencies, if so what are they?

- What are the risks of this current strategy, do you view in the future a change in the approach of capability development implementation?

- Do you view the current approach to capability development as an influential component to achieve a competitive advantage in the industry?

- What are the most relevant future opportunities in technology for beverage nutrition or the push for these types of drink alternatives from your perspective?

8.4 Questions for Anonymous 1 company

- Is it ok to record this interview and to use your name and the company in our research?
- What do you consider are the greatest benefits for the beverage industry when applying enzymes in their products?
- How would you describe the collaboration process in the industry between a company like the one you work for and a beverage company?
- What important factors are considered in the decision process?
- For the research and development of enzyme solutions does the company collaborate with other partners?
- Are there any current challenges in the development of these solutions or in acquiring collaborations?
- Does external market or other trends impact/ influence the development of technologies in your company? If so, what are the most significant trends?
- What are the most relevant future opportunities in enzyme technology or other tech relevant for beverage nutrition?