BMS FACULTY – MSC BUSINESS ADMINISTRATION

THE SUPPORT OF REGIONAL ENTREPRENEURIAL ACTORS FOR INNOVATIVE KNOWLEDGE-INTENSIVE ENTERPRISES

MASTER THESIS

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PREFACE

Dear reader,

In front of you lies my master's thesis, “The support of Regional Entrepreneurial Actors for innovative Knowledge-Intensive Enterprises”. This research aims to discover how regional entrepreneurial actors support Knowledge-Intensive Firms, so-called KIEs. To conduct this research, interviews were conducted with regional entrepreneurial actors and companies that could be classified as KIEs. This research is conducted in the period starting from December 2022 till January 2024.

Now, I want to thank all the people who helped me to make this research possible. First, I want to thank Tamara Oukes for her extensive supervision during the beginning and startup of the study. I appreciated all the help I got. Secondly, I want to thank Brenno Buarque for his helpful feedback and brainstorming sessions. Also, I want to thank him for all the data he shared with me. This data is necessary for this research to be complete. Thirdly, I want to thank the main supervisor Igors Skute, for taking over the supervision from Tamara. Without Igors, the study was in loose hands, so thanks a lot for your supervision and support. Lastly, I want to thank Martin Stienstra for becoming my second supervisor.

I hope that you will enjoy reading this thesis and that the conclusions and findings will be useful. Maybe you are a company that is doubting participating in an innovation program. As an entrepreneur, this research will give you insight into how regional entrepreneurial actors can support your organization.

Kind regards,

Ralph Sikosek

Enschede, January 2024

ABSTRACT

Innovation is essential for economic performance and to be able to cope with competitors. To be able to innovate, organizations should be able to adapt fast to changing conditions. Knowledge-intensive enterprises (KIEs) play an important role in innovation. KIEs are enterprises that are heavily reliant on knowledge and Research & Development (R&D) during their operations (Sousa, 2018). Therefore, they can innovate more quickly and be more impactful when compared to regular companies. However, this characteristic also imposes bigger challenges. KIEs, when compared to regular companies, need more skilled professionals, higher R&D investments, more financial resources, and a greater network to be able to survive. Regional Entrepreneurial Actors (REAs) could support KIEs to overcome these challenges and survive the Valley of Death (VoD). REAs play a role in supporting, mentoring, and developing entrepreneurship, and could comprise individuals or organizations (Klimas & Czakon, 2022).

The primary focus of the research is to explore the role of Regional Entrepreneurial Actors (REAs) in supporting KIEs. Additionally, it explored if there is a connection between REA support and firms' dynamic capabilities. It could be the case that the impact of REA support depends on how well-developed the dynamic capabilities of the KIE are. Specifically, the study investigated how REAs support KIEs in the following key areas: providing access to networks, facilitating the acquisition of new knowledge, assisting in building a quality workforce, investing in scientific research, supporting the R&D process, and offering essential business resources.

To gain insights, interviews were conducted with companies and regional entrepreneurial actors in Twente and Groningen. The findings highlighted that the primary focus of these actors is to guide business ideas into mature and viable business models. They achieve this by granting access to networks comprising potential buyers, suppliers, and experts who offer valuable advice. Furthermore, REAs promote innovation by providing necessary resources like offices, buildings, and specialized machinery for production processes. Notably, some actors take on the R&D responsibility for entrepreneurs. The support of REAs is indeed helping KIEs to overcome the VoD in some cases. However, the impact of the support also depends on the internal dynamic capabilities of KIEs, and the region in which they operate. The better the internal dynamic capabilities, the higher the impact.

The research also emphasized the benefits that entrepreneurs gain from the concentration of the entrepreneurial ecosystem and its associated actors. Entrepreneurial ecosystems make it easier for companies to seek the support needed for their development, resulting in improved access to knowledge and a skilled workforce.

Moreover, the research revealed major differences between two different entrepreneurial ecosystems. While the Twente ecosystem plays a leading role in supporting innovation, the actors in the Groningen ecosystem sometimes discourage it. This lack of interconnectedness among actors in the second ecosystem restricts its potential to lead in innovation.

In conclusion, REAs play a significant role in supporting Knowledge-Intensive Enterprises, and fostering innovation and economic growth. Understanding the dynamics of this support and its impact on a firm's capabilities can contribute to developing a more effective and collaborative entrepreneurial ecosystem.

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1. INTRODUCTION

1.1 SITUATION AND COMPLICATION

Technology, consumer tastes, laws, and regulations are all changing rapidly. Companies need to address these rapidly changing environments. Therefore, organizations need well-developed dynamic capabilities to be able to generate, assimilate, and utilize knowledge effectively. (Buarque, 2022; Laaksonen & Peltoniemi, 2016; Teece, 1997). In this dynamic landscape, Knowledge-Intensive Enterprises stand at the forefront. Unlike regular companies, which primarily leverage physical resources or capital, Knowledge-intensive companies heavily rely on knowledge throughout their operations and heavily invest in Research and development (R&D). This reliance on knowledge and R&D creates challenges concerning financial and workforce resources that are needed for the KIE to operate (Bertello, et al. 2022).

Knowledge-Intensive Enterprises are heavily relying on knowledge during operations, and this has certain advantages. By exploiting knowledge, KIEs can grow faster and exploit higher levels of innovation when compared to regular companies (McKelvey & Lassen, 2013; Todtling, et al. 2006). The innovative nature of KIEs offers certain benefits. First, innovations originating from KIEs could lead to novel technological products or services for customers present in the market. These innovations could disrupt the industry, and this may be beneficial for customers. Breakthroughs in healthcare and energy technologies are often caused by the efforts of Knowledge-Intensive Enterprises (AWTI; Erasmus University, 2020). With today's challenges, such as climate change, innovations are needed to bring solutions to these challenges. In addition, Knowledge-Intensive Enterprises are significant contributors to job creation. They attract and empoloy highly knowledgeable and often skilled professionals, indirectly stimulating economic growth in the regions where they operate (Sousa, et al. 2017). These benefits are the main reasons why KIEs are of such great importance.

However, as promising and important as KIEs may be, they also face challenges during their startup phase and operational phase. The innovation process of KIEs is very challenging. Since KIEs need more information and knowledge than regular companies, they need to manage more information coming from more different sources. Managing these varieties of information streams sometimes is difficult for KIEs (Malerba & McKelvey, 2018). In addition, KIEs could also face a lack of experts in the field. KIEs often require employees with a lot of skills and technical knowledge, and acquiring these employees is difficult in markets where demand is high (Markova, et al. 2022). Next, KIEs, mainly in the startup phase, face the barrier of lack of financial resources. The required investments in R&D are higher than for non-KIEs, and the return on these investments is often uncertain. These high investments often prevent KIEs from scaling, which could lead, ultimately, to failure (Ford, et al. 2007). Another barrier is the networks KIEs possess. If KIEs have good technological knowledge but lack the networks to develop or sell the products, the innovation may be not as disruptive as expected. In short, a lack of networking capabilities could hinder the innovativeness of KIEs (Parida, et al. 2016; Zaheer & Bell, 2005). KIEs not able to overcome these barriers is a reason that KIEs still fail. In the Netherlands, only 10 percent of startups are successful in the long run, and only 12 percent of those successful startups is a KIE (Rosenthal, et al 2020). This means that a lot of KIEs are failing to exist, or are not able to develop from a start-up to a scale-up, making them less impactful. Some of these barriers are also described by the

Valley of Death (VoD). The VoD reflects a series of challenges that are being faced by technology-based companies during their early development stages. VoD situations include but are not limited to, funding gaps, failed commercialization, or a lack of governmental support (Gbadegeshin, et al. 2022). As can be noted, these situations are even more of a problem with KIEs than for non-KIEs.

For KIEs to be successful, previously mentioned barriers need to be overcome. To overcome these challenges, KIEs often need to receive support from external partners. One example of these partners could be described as Regional Entrepreneurial Actors. Regional Entrepreneurial Actors are individuals, organizations, or entities that play a role in supporting, promoting, and developing entrepreneurship in a specific region (Klimas & Czakon, 2022; Stam 2015). The first element of REA is “regional”, which means that the support of REAs is bound to a geographically bound location. The second element is “entrepreneurial”, which means that it is focused on supporting entrepreneurs, which are people working in companies that see opportunities and take risks, and by doing so can make money (Cambridge Dictionary, 2023). The last aspect is “actors” which could be individuals or organizations. The support from REAs could not only help to overcome the challenges that are faced by KIEs, but also help them to innovate and succeed more quickly. REAs oftenoffer support in return for a small financial compensation. Some do not require a financial return but are initiated by the government or knowledge institutions. These REAs are active in improving the entrepreneurialism and innovativeness of the region (Madaleno, et al. 2018).

The support from Regional Entrepreneurial Actors is aimed to help overcome the barriers KIEs face. REAs could offer KIEs a jumpstart by providing capital or other resources (Edler & Fagerberg, 2017). In addition, they offer mentorship and guidance and could give access to a great network of experts and professionals. REAs are aimed at assisting the development and growth of new businesses during the initial stages of business execution. In addition, they could help with improving the personal skills of employees, such as communication skills, and could help with funding and building a network. However, the support of REAs might be valuable, the extent to which this support is experienced could depend on the entrepreneurial capability of the firm itself.

1.2 CONTRIBUTION OF THE STUDY

In past research, the factors that could support the valorisation process of a KIE firm have already been identified. These factors are a favorable business environment, a quality workforce, a network, or good absorptive capabilities (Patanakul & Pinto, 2014). However, it is still unknown if these factors, and to what extent, influence the dynamic capabilities of KIEs. In this research, evidence will be gathered if the REAs support the KIEs with factors that support their innovation process, and if this could help companies to overcome the Valley of Death. More importantly, it will also be discovered if those factors have an indirect influence on the dynamic capabilities of Knowledge-Intensive Enterprises. This is in contrast with other research, that describes the direct effect of support on companies. During this research, the dynamic capabilities will be used as an intermediary to describe the effect of support on Knowledge-Intensive Enterprises. The intermediary effect of dynamic capabilities could be twofold. First, the support of REAs could leverage the conditions in which companies could improve their dynamic capabilities. Second, the internal dynamic capabilities, already present in the company, could make the support of REAs more valuable. The objective of the research is to find out if one or both statements are true. Next, most

research focuses on the effect of entrepreneurial actors on the economic variables at the macro level. This research will mainly focus on the effect of regional actors on KIE firms that are active in the region of Twente and Groningen. In other words, this research will focus more on the effect of entrepreneurial actors on the dynamic capabilities of KIE firms on a regional level.

To get to know if REAs can help KIEs overcome the valley of death, by supporting them in their innovation process, and indirectly influencing the dynamic capabilities of those firms, the following research question was phrased:

"What is the influence of regional entrepreneurial actors' (REAs) support on the dynamic capabilities of innovative knowledge-intensive enterprises (KIEs)?"

1.3 OUTLINE

In the remainder of the thesis, theory on KIEs, REAs, innovation in general, and dynamic capabilities will be discussed. Afterwards, the theory and research question will form the basis for the research framework which will be explained in-depth at the end of the theoretical section. Next, the research methodology section will cover the setup of the research and will describe the research setting, as well as the Gioia method for data analysis. Next, the results section will start with a description of the actors that are interviewed. After, the code tree will be displayed, and the interview data will be discussed. At the end of the thesis, a conclusion will be drawn, and suggestions for future research will be given.

2. THEORETICAL FRAMEWORK

2.1 KNOWLEDGE-INTENSIVE ENTREPRENEURSHIP

Knowledge-intensive enterprises (KIEs) represent a type of entrepreneurship where companies heavily rely on knowledge throughout their operations (Malerba and McKelvey 2020). The concept of KIE holds high relevance in the domain of public policy due to its potential to stimulate knowledge, innovation, and entrepreneurship, as indicated in the work of Malerba and McKelvey (2019).

One of the key characteristics of KIE is its ability to grow faster and exploit higher levels of innovation compared to regular companies (McKelvey and Lassen, 2013). The reason for this is the innovativeness of KIEs, which attracts attention from bigger companies seeking promising innovations. An example of a KIEs is the Dutch startup Mayht, which together with the TU Delft, developed a revolutionary speaker design enabling smaller speakers to match the acoustic output of larger ones. Sonos, a major player in the multiroom speaker industry, recognized the potential of Mayht's technology and subsequently acquired the startup, This is an example of how KIEs often could get significant investments and attention from larger enterprises.

The significance of KIE is not only present in high-tech industries; KIEs can also exist in industries with low to medium-tech characteristics, as highlighted by Caloghirou et al. (2015). A crucial aspect that distinguishes Knowledge-Intensive Enterprises from normal companies is the strong focus on research and development (R&D). By investing heavily in R&D, KIEs can exploit new technological opportunities, leading to innovation that provides benefits for their respective sectors and customers (Sousa et al., 2017).

For a company to be truly regarded as a KIE, it must meet four conditions, as discussed by Malerba and McKelvey (2020). Firstly, the firm should be an independent entity, separate from existing organizations or subsidiaries. Secondly, it must demonstrate a commitment to innovation, ruling out imitating practices from other companies, and the sale of standardized goods. Thirdly, the firm should embrace knowledge-intensive processes in its pursuit of innovation and competitiveness, employing knowledge to solve problems systematically and gain a competitive advantage.

Lastly, a KIE must actively exploit innovative opportunities that arise from market developments and technological advancements. Identifying and testing these opportunities in the market may take time, but this process is very important for the continued growth and success of a KIE. In addition, the success of a firm operating as a Knowledge-Intensive Enterprise depends on various factors. The uniqueness of the products plays a crucial role, along with effective marketing strategies and a strong commitment to customer service, as emphasized by Malerba et al. (2016). These factors, combined with the innovative nature of KIEs, contribute to their positive impact on innovation, economic growth, and the overall entrepreneurial landscape.

2.2 INNOVATION AND INFLUENCE OF REA

2.2.1 What is innovation

Regional entrepreneurial actors can effectively support innovation and thus Knowledge-Intensive firms. To understand this support, it is crucial to first understand the concept of innovation. Innovation involves the introduction of new solutions in response to social or economic challenges, problems, or opportunities. It relies on combining existing knowledge, capabilities, or resources to generate novel knowledge and capabilities (Edler & Fagenberg, 2017).

Organizational innovation can be distinguished into two types of innovation; exploitative innovation and explorative innovation (Jansen, et al. 2006). The distinction of the two types of innovation is based on two dimensions; the relatedness to existing technologies, skills, knowledge, products and services and the relatedness to existing customers and markets (Mueller, et al. 2013). Exploratory innovations are associated with search, discovery, and experimentation (Mueller, et al. 2013). When firms are dealing with exploration, they are not able to rely on familiar knowledge. Exploratory innovations are aimed at creating and commercializing radically new products, services, or business models that serve new customer needs or create new customer demands. (Abernathy & Clark, 1985). Explorative innovation incurs higher risk since it disrupts existing competencies and market linkages. The creation and commercialization of these innovations require a large amount of resources, which could only prove to be beneficial in the long run. Explorative innovation also offers certain advantages, such as generating new sales in new markets or being able to charge a premium for new disrupting products or services (Mueller, et al. 2013). These innovations also have a positive effect on skills and capabilities necessary for survival and long-term competitiveness (Morgan & Berthon, 2008; Tsai & Huang, 2008). KIEs can generate more explorative innovations than non-KIEs due to their nature of being knowledge and resource-intensive.

Exploitative innovations on the other hand are aimed at creating and commercializing improved or refined products, services, and business models to meet the needs of existing customers or markets (Mueller, et al. 2013). These types of innovations are often familiar to customers and the firms in the industry; thus they incur lower risk, which could be seen as a benefit when compared to explorative innovations. Because exploitative innovations often have high similarities with other products economies of scale could be utilized and profit margins could be increased. Organizational actors can use the experience and knowledge that they already possess, and use the existing market linkages. Exploitative innovations may help the firm to extend the life cycle of its offerings (Menguc & Auh, 2010). However, the main disadvantage of exploitative innovations is that they are often only associated with “normal” profits, because they are not disrupting the market or serving new needs.

Moreover, it is essential to distinguish innovation from invention. While invention explains the occurrence of a novelty, innovation goes beyond only the generation of new ideas. It is about the successful adoption and exploitation of those ideas to create a competitive advantage and address societal challenges (Kline & Rosenberg, 1986).

Innovations are not static, they undergo frequent pivots throughout their lifetime. Any changes made to an innovation can significantly impact its economic significance. Understanding these dynamics is crucial for sustaining success in a dynamic and ever-changing business environment.

Factors driving innovation can be viewed from two main perspectives: the market-based view and the resource-based view (Kogabayev & Maziliauskas, 2017). The market-based view emphasizes how market conditions can either hinder or foster innovations. Successful innovations occur when companies adapt to changing market conditions, allowing them to fully exploit the potential of their innovations.

On the other hand, the resource-based view argues that more than just a promising market is needed to exploit innovations. Firms must possess adequate resources to foster successful innovations. These resources play an essential role in enabling companies to adapt to dynamic market conditions and enhance their innovation capabilities (Baregheh, et al. 2009).

By understanding innovation, its differentiation from invention, and the factors influencing successful innovations, entrepreneurial actors can better support Knowledge-Intensive firms, fostering growth and competitiveness in a rapidly evolving economic landscape.

2.2.2 Factors promoting innovation

The framework developed by Patanakul and Pinto (2014) offers an approach to determining the key factors driving innovation. It consists of three fundamental aspects that collectively influence a company's pace of innovation.

The first aspect is the "Willingness to Change." This element is shaped by the firm's core values and its awareness of potential changes that might be required. Embracing a culture open to change is vital for fostering innovation (Patanakul & Pinto, 2014). The second aspect is “Ability to Change” which describes the company’s capacity to adapt and implement new technologies. The third aspect is “Opportunity to Change” which describes the ability of the company to align the technology available for adoption with the technology currently utilized by the firm.

The framework suggests that certain general factors can promote innovation, which directly influences the three fundamental aspects that are mentioned above. First, it could offer a favorable business environment which is an environment that supports and encourages innovation. Secondly, it could offer infrastructure and business platforms which entails robust infrastructures and platforms that facilitate innovation efforts. Thirdly, innovation can be fostered by investing in scientific research which entails allocating resources to scientific resources to generate new insights and possibilities. Fourthly, a high-quality workforce could offer skilled and capable employees who could contribute to innovation. Lastly, a stringent and focused innovation policy could foster innovation since it could help companies to guide the innovation initiatives of the companies. These factors can also be influenced by regional entrepreneurship actors.

2.2.3 Influence of REA on innovation

Regional Entrepreneurial Actors (REA) play an important role in the innovation and entrepreneurial ecosystem. These regional entrepreneurship actors are essential components of the entrepreneurial ecosystem. They actively engage in entrepreneurial activities and often focus on providing support and mentorship to early-stage ventures (Klimas & Czakon, 2022).

Typical actors found in an entrepreneurial ecosystem include angel investors, innovation accelerators, research institutes, universities, incubators, venture capital organizations, and business service providers (Majava et al., 2016). In the United Kingdom, more than 400 entrepreneurial actors are active, supporting more than 3660 new businesses per year. Together they account for a total investment of 33 million GBP per year in innovative startups (Bone, et al. 2017). Universities, in particular, are of importance as they secure research funding, contribute to the development of new technologies and ideas, license innovations, and train a talented workforce, thus creating a pool of skilled individuals. Other knowledge institutions, such as universities of applied sciences contribute in similar ways to the entrepreneurial ecosystem. REAs often have close connections with other businesses, initiatives, and technology partners (Edler & Fagerberg, 2017; Uhm, et al. 2018).

Accelerators and incubators are also key players. Accelerators offer structured mentoring and coaching to start-ups while facilitating networking and funding opportunities by connecting companies with early-stage funding. Incubators, on the other hand, provide physical resources like office space and offer mentoring aimed at guiding entrepreneurs and aiding them in making informed decisions (Miller & Bound, 2011). In previous research, a regression analysis was conducted with data from 609 companies, which showed that an innovative startup is likely to perform better if it is backed by an accelerator or incubator (Mulliq, 2019).

Furthermore, another significant role of regional entrepreneurship actors is their ability to collaborate with policymakers and governments to advocate for better and improved policies that support entrepreneurship in the specific innovation region. By advocating for favorable conditions, they help create an environment that stimulates entrepreneurial growth.

Regional Entrepreneurial Actors do what they do for numerous reasons. Sometimes the Regional Entrepreneurial Actors help entrepreneurs in return for a (small) financial compensation. It could also be the case that REAs are active because of policies originating from the government or municipalities (Moritz, et al. 2022).

In conclusion, regional entrepreneurial actors are essential in promoting and supporting entrepreneurship within the entrepreneurial ecosystem. From universities contributing to research and innovation to accelerators and incubators nurturing start-ups, along with their advocacy efforts, all these actors collectively contribute to enhancing the entrepreneurial ecosystem's potential for fostering innovation and entrepreneurial success.

2.3 KNOWLEDGE-INTENSIVE ENTREPRENEURSHIP (KIE) FIRMS AND DYNAMIC CAPABILITIES

In exploring the connection between innovation, regional entrepreneurship actors (REA), and Knowledge-Intensive Entrepreneurship (KIE), it becomes crucial to discuss the dynamic capabilities exhibited by KIE firms. Understanding this aspect is essential as it may reveal how REAs indirectly influence the dynamic capabilities of such firms.

The main framework of dynamic capabilities was created by Teece in 1997. The term “dynamic” refers to being able to renew competencies to cope with changing business environments. To be able to innovate effectively, timing is essential. This is because the rate of technological change is rapid (Teece, 1997). The term capabilities refers to the capabilities of the company to adapt, integrate, and reconfigure internal and external organizational skills, resources, and functional competencies to match the requirements of the environment (Teece, 1997). In short, dynamic capabilities are the ability of a firm to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece, 1997). The dynamic capabilities reflect the ability of an organization to achieve new and innovative ways of competitive advantage given certain market positions (Leoard-Barton, 1997).

Next to dynamic capabilities, a company possesses ordinary capabilities. It is important to make a distinction between the two. Ordinary capabilities involve the performance of administrative, operational, and governance-related functions that are necessary to execute current plans (Teece, 2016; Teece, 2007). In this view, dynamic capabilities can be seen as higher-level activities that enable an enterprise to direct its “ordinary” activities toward high-demand uses. In short, ordinary capabilities are capabilities that are needed to meet current performance objectives. Ordinary capabilities are about being efficient, while dynamic capabilities are about learning and improving and about being innovative (Teece, 2016; Teece, 2007).

REAs could influence the factors that promote innovation, which could force KIEs to improve their dynamic capabilities. For instance, REAs can offer entrepreneurs the opportunity to interact within networks facilitated by entities like incubators. This engagement within networks may enhance the networking capabilities of KIE firms. Additionally, if a regional entrepreneurial actor assumes control over an entrepreneur's product's R&D, the entrepreneur could potentially learn from the actor's practices, thereby improving their R&D capabilities. If this is true is still open for discussion.

Dynamic capabilities encompass a broader set of a firm's capabilities and can be perceived as a higher-order category, as indicated in the Conceptual Model (section 4.4). The research focuses on network and absorptive capabilities, as these are particularly important for Knowledge-Intensive companies (Buarque et al., 2022). R&D capabilities are also included in the study, given their integral role in the innovation process, specifically enabling companies to develop as KIE firms during the early stages of their development.

Network capabilities hold significance during the firm's developmental phase, enabling it to build relationships within their market sector for success. Networks play a crucial role in information flow and transforming it into tangible goods or intangible services to drive business (Walter & Ritter, 2006). Absorptive capabilities, on the other hand, are essential for a firm to identify and assimilate new information, as without this capacity, innovation becomes challenging. These capabilities have been specifically chosen as dynamic

capabilities in this research due to their importance in the early stages of company development.

Although there are other capabilities such as HR (Human Relations) and commercialization capabilities, their significance becomes more evident in the later stages of company operation. Since a lot of companies that will be interviewed are KIEs in the startup phase, the chosen capabilities have a higher significance. Moreover, network capabilities, absorptive capabilities, and R&D capabilities are most closely tied to innovation, making them the focus points of the research. In addition, these capabilities are the most important for the development of knowledge-intensive companies (Buarque, 2022). In this section, we will begin by discussing the network capabilities in detail.

2.3.1 Network capabilities

A firm's network capability refers to its ability to build, handle, and exploit relationships (Vesalainen & Hakala, 2014). This definition is true for all relationships, with all the different shareholders of a firm. This could be a partner, a supplier, or even a competitor. Networks enable the flow of knowledge and capabilities necessary to transform scientific knowledge, with a proper understanding of the market, into products and goods (Sousa-Ginel, 2017).

Prior studies have concluded that network capabilities are very important in creating a competitive advantage, especially for KIE firms. Only by developing good networking capabilities, KIE firms can gain experience in commercializing a new product in a new sector, particularly in the first years of doing business, where knowledge of product development and technology transfer is crucial (Boccardelli & Magnusson, 2006). Networks are essential for acquiring resources and support (Sousa-Ginel, 2017).

For KIE firms, network capabilities are valuable as they function as a source of technological knowledge. Additionally, networks could offer a KIE firm numerous commercial opportunities (Walter, Auer & Ritter, 2006). In 2010, a survey by Malerba examined 99 companies in Western Europe, revealing that almost all companies find networks important. Networks of KIE firms are broader than networks from regular companies and often include innovation system actors, such as universities and research institutes. KIE firms utilize two main types of networks - horizontal networks (links with domestic public research systems) and vertical networks (foreign or domestic value chains) (Malerba et al., 2016).

Managers of KIE firms decide to cooperate in networks because this increases information sharing, which helps generate innovation and consequently increases the participation of members of a network. In conclusion, the participation of KIE firms in networks is essential because it allows them to commercialize their products and acquire market share.

2.3.2 Absorptive capabilities

Absorptive capacities and capabilities are vital for the innovation process and improving a company's competitive advantage (Zahra & George, 2002). Absorptive capacities refer to an organization's ability to acquire, assimilate, transform, and apply new information, making them critical for fostering innovation within the organization (Cohen & Levinthal, 1990).

The acquisition involves identifying external knowledge, while assimilation focuses on interpreting and understanding the gathered knowledge. The transformation aspect is about effectively combining and integrating new information with existing knowledge. Lastly, the application refers to applying new knowledge for commercial ends (Zahra & George, 2002). The firm's absorptive capability requires individuals to learn new ways of acting and to absorb new knowledge. First, absorptive capacity involves engaging in new practices, this means that individuals need to adapt to new practices which are different from the existing ones (Cohen & Levinthal, 1990). Secondly, the firm's absorptive capacity involves the development and application of knowledge structures that enable the updating of learned practices. This could impose internal problems when there is a lack of coherence or when they conflict with current knowledge or knowledge structures (Cepeda-Carrion, et al. 2012). This is the result of the differences between beliefs, and habits that individuals within the company take for granted which underpin the existing knowledge and knowledge structures. In short, companies need to reorientate organizational values, norms and behaviors (Cepeda-Carrion, et al. 2012).

The support of REAs is mainly focused on the first two aspects of absorptive capabilities. A REA can help a KIE to get in contact with experts through the networks that are offered by REAs. In this way, it could be easier for KIEs to acquire new knowledge. In addition, REAs could offer employees or managers training sessions in which they could help to assimilate this gathered knowledge. The last two aspects of absorptive capabilities; transformation and application are mostly internally driven (Ince, et al. 2017). Hence, these aspects cannot be influenced directly. An REA cannot directly support the absorptive capabilities, but could only leverage the conditions in which the company could improve its absorptive capabilities.

A distinguishment can be made between two types of absorptive capabilities (Zahra & George, 2022). The first one is Potential Absorptive Capability (PACAP), which is associated with acquisition and assimilation. PACAP enables the company to be receptive to acquiring and evaluating external knowledge. On the other hand, Realized Absorptive Capacity (RACAP) revolves around transformation and exploitation, emphasizing the ability to effectively use the acquired knowledge (Zahra & George, 2002).

It is important to highlight that these absorptive capabilities play a crucial role in innovation. To function properly, absorptive capabilities require prior knowledge to effectively evaluate and utilize new knowledge (Cohen & Levinthal, 1990).

In summary, an organization's absorptive capacities and capabilities are fundamental for driving innovation and gaining a competitive edge. By fostering the ability to recognize, assimilate, and apply new information, businesses can continuously evolve and enhance their position in the market.

2.3.3 R&D capabilities

In the context of innovation strategy, two key aspects can be distinguished: R&D strategy and R&D capabilities. The R&D strategy is closely tied to the innovation strategy, and it defines three fundamental questions that drive the innovation process:

1. What do we want to deliver?
2. What do we need to deliver? This second question pertains to R&D capabilities—the technical abilities required to discover, develop, and scale marketable solutions (Brennan et al., 2020).
3. How do we deliver it?

To achieve successful innovation, a clear R&D strategy is essential. Not all R&D capabilities are equal; some technical capabilities need to be "best in class," while others only need to be "sufficient." The prioritization of R&D capabilities varies for each company, depending on their specific context and goals (Brennan et al., 2020). Improving R&D capability enables the development of new products and the utilization of new processes (Kim & Choi, 2020).

While R&D capabilities and the valorisation process are closely related, they serve distinct functions. R&D capabilities are primarily focused on the technological aspects of innovation and are more internally oriented. On the other hand, the valorisation process is centered around bringing products to market faster (Lindegaard, 2016).

In conclusion, understanding and effectively managing both R&D strategy and R&D capabilities are crucial for driving innovation and achieving sustainable success in today's dynamic business landscape.

2.3.4 Valorisation process

Valorisation process, in this research, is the overarching process driving innovation. This can also be seen in the framework in the next section, the performance of the mentioned capabilities together depict how capable a company is to innovate and valorisate. The valorisation process is crucial for firms to identify and transform new ideas into valuable products, services, or processes, providing significant benefits for end-users, sometimes disrupting industries, or creating new markets (Yoo & Kim, 2015). There is an overlap with the definition of dynamic capabilities, however, one of the main differences is that the valorisation process can be dynamic or non-dynamic (Teece, 1997). Valorisation activities are not necessarily dynamic if they do not contribute to the long-term capacity to adapt to changing environments. In short, the valorisation process is often highly dynamic if it contributes to the recombination and transformation of organizations' knowledge and resources, but it does not strictly have to (Stronen, et al. 2017).

To succeed in the globalized and fast-paced business environment, organizations must effectively manage change in volatile and complex ecosystems. The valorisation process is more focused on the internal organizational structure, whereas R&D capabilities are more focused on human capital and technological know-how.

The valorisation process depends on a firm's ability to allocate resources effectively to create value for customers. Various factors contribute to a company's innovativeness, and Lawson and Samson (2001) identify seven key elements: vision, competence base, organizational

intelligence, creativity, idea management, organizational structures, organizational culture and organizational climate, and management of technology.

Organizational culture emerges as a vital factor in fostering the valorisation process, as researchers assert its importance. When a company cultivates innovation as part of its culture, employees tend to think more creatively and generate ideas beyond conventional boundaries, largely due to reduced fear of failure (Aas & Breunig, 2017).

Moreover, the valorisation process is recognized as among the most critical for gaining a competitive advantage (Aas & Breunig). As a result, the valorisation process play a vital role in Knowledge Intensive Entrepreneurship (KIE), making them very important for businesses seeking sustainable success.

In conclusion, the valorisation process can be seen as a vital element for firms seeking sustainable success in today's dynamic business world. By effectively managing change, nurturing a culture of innovation, and embracing the seven key elements of innovativeness, organizations position themselves at the forefront of progress, ensuring continuous growth and competitive advantage in the face of uncertainty.

2.4 RESEARCH FRAMEWORK

Based on the theory, a research framework is created. This research framework is based on the framework described by Patanakul & Pinto. However, there are changes. First, the influence of Regional Entrepreneurial Actors is added. Secondly, the internal impact of dynamic capabilities is visualized in the model.

The framework lists the factors that promote innovation in the lightest orange on the left. The first element is a favorable business environment. How favorable the business environment is depends on the “willingness to change” and “ability to change” paradigms. A company that embraces a culture open to change is vital for successful innovation (Patanakul & Pinto, 2014; Moreira, et al. 2016). Therefore, a favorable business environment could positively influence the valorisation process of a company.

An infrastructure and business platform, offered by regional entrepreneurial actors could leverage the networking capabilities if this platform introduces the entrepreneur to other actors and experts. This assumption is based on that Regional Entrepreneurial Actors are often connected to other businesses and technology partners (Edler & Fagerberg, 2017; Huyn, et al. 2017). The other way around may also be true. If a company possesses better networking capabilities, it may lead to business platforms and infrastructures that could have a higher impact on innovation capability. This assumption is based on the fact that networks enable the flow of knowledge and capabilities necessary to turn scientific knowledge into products and goods (Sousa-Ginel, 2017). In addition, the dynamic capabilities could also influence each other. If a company possesses better networking capabilities, this could leverage the absorptive capabilities. With a comprehensive network, experts can be found which could help with finding and assimilating new information.

Next, an investment in scientific research done by REAs could leverage the conditions in which companies could improve their absorptive capabilities if this research yields new insights that the company could use to innovate. As already mentioned, REAs could only influence the acquisition and assimilation process of knowledge. They could help KIEs to come in contact with experts that could give the KIE new insights, which could lead to novel information. In addition, training sessions or knowledge-sharing sessions could help companies to better assimilate this knowledge. The other aspects of absorptive capabilities remain internally driven, so this cannot be directly influenced by REAs. Literature on PACAP postulates that greater investment in knowledge creation could lead to an improvement of absorptive capabilities if this potential is utilized (Zahra & George, 2002). If a company exhibits better absorptive capabilities the valorisation process will also improve.

Another aspect that could be influenced and stimulated by REAs is the acquisition of a quality workforce. It could be the case that, due to the networks of the REAs, they can help KIEs with finding knowledgeable employees, due to the proximity of other businesses and technology partners with a talented, possibly recruitable pool of employees. The effect of a quality workforce on dynamic capabilities could be twofold. Knowledgeable employees could improve their R&D capabilities, if those employees possess the knowledge to produce innovative products. A quality workforce could also lead to an improvement in absorptive capabilities if this new quality workforce can better assimilate the information it retrieves. This assumption hinges on the paradigm of “ability to change”, where the innovation capability depends on the technical knowledge and skills of businesses and thus their staff (Patanakul & Pinto, 2014).

A stringent and focused innovation policy has a direct positive impact on valorisation process. Considering that the more the firm receives R&D investments and the hiring of

qualified labor, the greater its ability to learn to assimilate and transform knowledge into innovation.

When comparing the framework with the framework from Patanakul & Pinto, the indirect relationship of the dynamic capabilities is added, and more relationships are discovered.

A figure of the framework is displayed below.

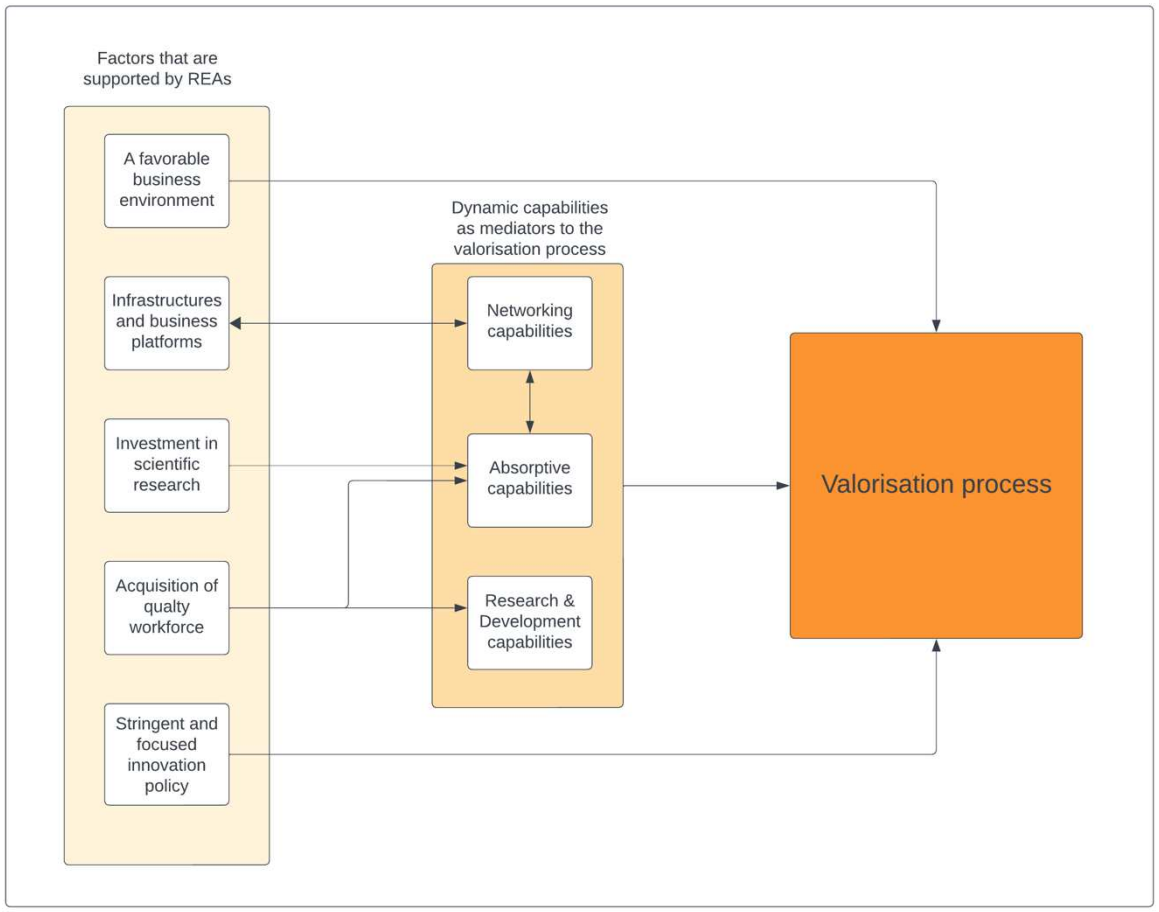

Figure 1: Research framework as proposed by Buarque and extended by me (2022).

3. RESEARCH METHODOLOGY

3.1 RESEARCH SETTING

The research is set in two different regions in the Netherlands. The first region is Twente, located in the Eastern part of the country. The region of Twente is selected because Twente is an appealing area for this research due to the university's emphasis on innovation, and it will be interesting to examine if this promotion of innovation translates into practical outcomes. In addition, the University of Twente has won three awards for being the “most entrepreneurial university” in the Netherlands (UTwente, 2023). In addition, in Twente, the Kennispark region can be found. The Kennispark region is an area in which entrepreneurs, government, and knowledge institutions join forces to fully use the area’s potential. This area consists of more than 400 high-tech companies and more than 900 spin-offs (Kennispark, 2024). In addition, in Twente the accelerator Novel-T is active. Novel-T helps startups that want to grow. With their support, consisting of programs and workshops, they try to accelerate the business case of startups. Novel-T is very active, since founding they have supported more than 700 entrepreneurs. and this makes the Twente region more interesting. Lastly, 10 percent of the fastest-growing tech companies in the Netherlands are founded in Twente (OostNL, 2023).

The second round of interviews will take place in Groningen. This region was chosen because of its association with Rijksuniversiteit Groningen (RUG), a large university with significant knowledge creation (around 4400 Ph.D. candidates). In addition, the big incubator Company 12 was originally founded in Groningen, so the region of Groningen will also possess an active business ecosystem. In addition, the Rijksuniversiteit Groningen also tries to be a driver of growth by supporting the Campus Groningen. The Campus Groningen is comparable to the Kennispark region. Campus Groningen consists of 190 companies, which is less than the Kennispark region (Campus Groningen, 2024). By selecting Groningen, the study aims to explore potential differences in innovation stimulation between the two regions.

In summary, the research will involve interviews with KIE firms in Twente and Groningen Twente was chosen because of its focus on innovation. Groningen, on the other hand, offers an opportunity to explore knowledge creation through its university and could present a contrast for potential regional innovation differences.

Sample

For the interview round in Twente and Groningen, two sampling methods are used: purposive sampling and snowball sampling.

Purposive sampling is chosen because it is essential to select participants who possess the detailed knowledge and experience sought in this research. Specifically, companies located near the Campus in Groningen and the Kennispark region in Twente are closely examined. Both of these areas have close ties with their knowledge institutions, mainly the RUG and the UT. Since the focus of this research is on companies heavily utilizing knowledge as a production factor, selecting participants with such connections is crucial. The sample includes regional entrepreneurial actors and research institutions, which will be chosen based on their location and connections. Actors collaborating closely with UT, RUG, Saxion, and Hanze Hogeschool are linked to highly knowledgeable and innovative startups.

Snowball sampling is employed during the research. This method allows for the possibility of interviewees having valuable contacts that could be relevant to this study. By leveraging the interviewees' networks, the study can identify and connect with other interesting actors for further interviews. For instance, an incubator or accelerator that has worked with numerous Knowledge-Intensive startups could provide contact details of other intriguing startups.

During the research, Campus Groningen and the Kennispark region serve as central hubs for making contact, as they consist of companies closely associated with knowledge institutions. Utilizing snowball sampling, the network of interviewees can facilitate reaching out to and interviewing additional relevant actors, such as incubators or accelerators that have experience with Knowledge-Intensive startups.

3.1.1 Recruitment process

For the interviews in the Twente region, we found interviewees through the University of Twente and its network of entrepreneurial startups. In addition, the entrepreneurial ecosystem named Kennispark proved to be useful, since it is a collection of innovative companies, some of which are connected to the UT. We also reached out to Novel-T. After identifying potential companies, we contacted them via phone calls and emails to establish connections with representatives willing to participate in the interviews.

In Groningen, Campus Groningen plays a central role in connecting us with companies, facilities, and institutions situated on or near the campus. To find suitable participants, we conducted calls with Campus Groningen, analyzing company profiles and descriptions listed on their website. Also Company 22 in Groningen was a useful source for getting in touch with companies, because Company 22 functions as a hub for innovative companies.

Another valuable resource was the Dutch Chamber of Commerce, where we sought companies. We applied filters to focus on companies located in the Groningen region. Furthermore, we prioritized those situated near Groningen Campus / Zernike Campus, given their frequent use of knowledge as a production factor.

Once the companies were selected, we employed various methods to connect with their employees. We started with arranging phone calls using the numbers available on their websites. During these calls, we explained the objectives of the research and the interview process. We also communicated the expected interview duration and offered the possibility for companies to receive the research results and understand its potential implications for their organization. The interviews themselves will take place through Microsoft Teams.

3.1.2 Interviews

To conduct the research, two types of interviews have been conducted. Firstly, interviews were held with KIEs. Secondly, regional entrepreneurial actors were also interviewed. This dual approach allows the study to explore two aspects. The first aspect focuses on understanding how companies that participated in innovation programs were influenced by regional entrepreneurial actors perceive the impact of such engagements. The second aspect delves into the intentions of these programs and actors and whether they align with the experiences of the entrepreneurs who benefited from them.

Given that the interviews are semi-structured and open-ended, they provide valuable in-depth information. The interview constructs can be found in Appendix 1

3.2 DATA ANALYSIS

The chosen research method for this study is qualitative research. This approach aims to gain an understanding of the phenomenon, specifically, how regional entrepreneurial actors can support Knowledge-Intensive Enterprises (KIEs) and the influence of innovation policies and programs on companies' dynamic behavior (Sofaer, 1999). This is also the main reason why is chosen for qualitative research because this research method gives the opportunity to find details and an in-depth understanding of the research topic (Aspers & Corte, 2019). During the interviews, human experiences are gathered concerning the support of REAs on their KIEs. On the other hand, quantitative research relies on quantitative measures for collecting and analyzing data to make predictions and generalizations (Kaya, 2013). In this research, all types of support, and its consequences, need to be explored in-depth.

The qualitative research will address how regional entrepreneurial actors can support Knowledge-Intensive Firms. To analyze the interviews in a systematic and structured manner, the Gioia methodology will be used (Gioia, et al. 2012). This method facilitates the identification and coding of relevant concepts from the interviews. The use of the Gioia method also aids in creating a data structure, which visually presents a clear overview of the data, enabling the identification of patterns and the answering of the research question.

Amberscript is employed for transcribing the interview data. As the interviews are conducted in Dutch, Amberscript also aids in the translation process. This tool plays an important role in transforming audio-recorded interviews into a text format, facilitating data analysis.

After transcription, Excel is utilized to create the Gioia data structure. By using Excel, we can efficiently manage and organize the interview coding. It provides a comprehensive view of the codes used and allows us to group related quotes from interviews under the same overarching theme, known as aggregate dimensions.

The analysis process involves several steps. Firstly, significant quotes from the transcripts are selected. Then, first-order concepts are identified, which are concepts present in the interviews but not yet categorized. Identifying first-order concepts involves identifying common words, phrases, terms, and labels mentioned by respondents. In this process little attempt is made to distill categories, so there could emerge a lot of first-order concepts (Gioia, et al. 2012).

Once all first concepts are listed, they are closely examined to detect links and patterns among them. This process yields second-order themes that represent distinct concepts created by combining first-order concepts (Sjodin, et al. 2023). We refer to literature to ensure a connection with the research question and remove redundant sub-themes. These themes encompass emerging patterns that can be described as phenomena.

Finally, the analysis seeks to identify more general "aggregate dimensions". These dimensions provide a higher level of abstraction than previous dimensions. Here, insights from the literature are used to align them to ensure that the outcomes are valid and relevant. The aggregate dimension is built on the first-order concepts and second-order themes to present a theoretically and practically grounded categorization that provides a useful overview of how regional entrepreneurial actors support the KIEs during their innovation process (Gioia et al., 2012; Sjodin, et al. 2023).

4. RESULTS

The research aimed to investigate the influence of regional entrepreneurial actors on Knowledge-Intensive firms. To answer these research questions, interviews were conducted with regional entrepreneurial actors and companies in Groningen and Twente. First, the actors that are interviewed will be introduced. Secondly, the code tree and some examples will be introduced. Thirdly, the propositions will be explained and afterward, the results that are presented in this section will be categorized based on the propositions.

4.1 ACTORS INTERVIEWED

The table below shows an overview of the companies participating in the interview. In addition, this overview shows the sector in which the company operates or the sector the regional entrepreneurial actor focuses on. The first table shows all the companies or regional entrepreneurial actors interviewed in Twente, while the second table shows all the companies or regional entrepreneurial actors interviewed in Groningen. As mentioned earlier, the interview script can be found in the Appendix.

Company name	**KIE / Regional entrepreneurial actor (REA)**	**Focus area / Role in ecosystem**
Company 1	KIE	Energy transition
Company 2	REA	Providing resources
Company 3	KIE/REA	Startup analysts
Company 4	REA	Stimulating innovation in the region
Company 5	REA	Business acceleration
Company 6	KIE	Medical technology
Company 7	KIE	Coffee and tea procession
Company 8	REA	Recruiter
Company 9	REA	Stimulating entrepreneurship for students
Company 10	REA	Student coaching
Company 11	REA	Knowledge institution

Table 1: Companies interviewed in the Twente region, the Netherlands, all company names are anonymized.

Now in the table underneath, all the companies and regional entrepreneurial actors that are interviewed in Groningen are listed.

Company name	**KIE / REA (Regional Entrepreneurial Actor)**	**Focus area / Role in ecosystem**
Company 12	REA	Accelerating businesses
Company 13	REA	Shaping innovative technological businesses.
Company 14	REA	Facilitating knowledge sharing
Company 15	REA	Giving advice on how innovation could be stimulated

Company 16	REA	Research & Development of product / idea
Company 17	KIE	Research & Development of product / idea or investment
Company 18	KIE	Energy transition
Company 19	KIE	Medical field
Company 20	REA	IP rights
Company 21	KIE	Agrifood technologies
Company 22	REA	Promoting, supporting and connecting entrepreneurs
Company 23	KIE	Automating business processes
Company 24	REA	Investment company

Table 2: Companies interviewed in the Groningen region, the Netherlands, company names are anonymized.

4.2 INTERVIEW CODING

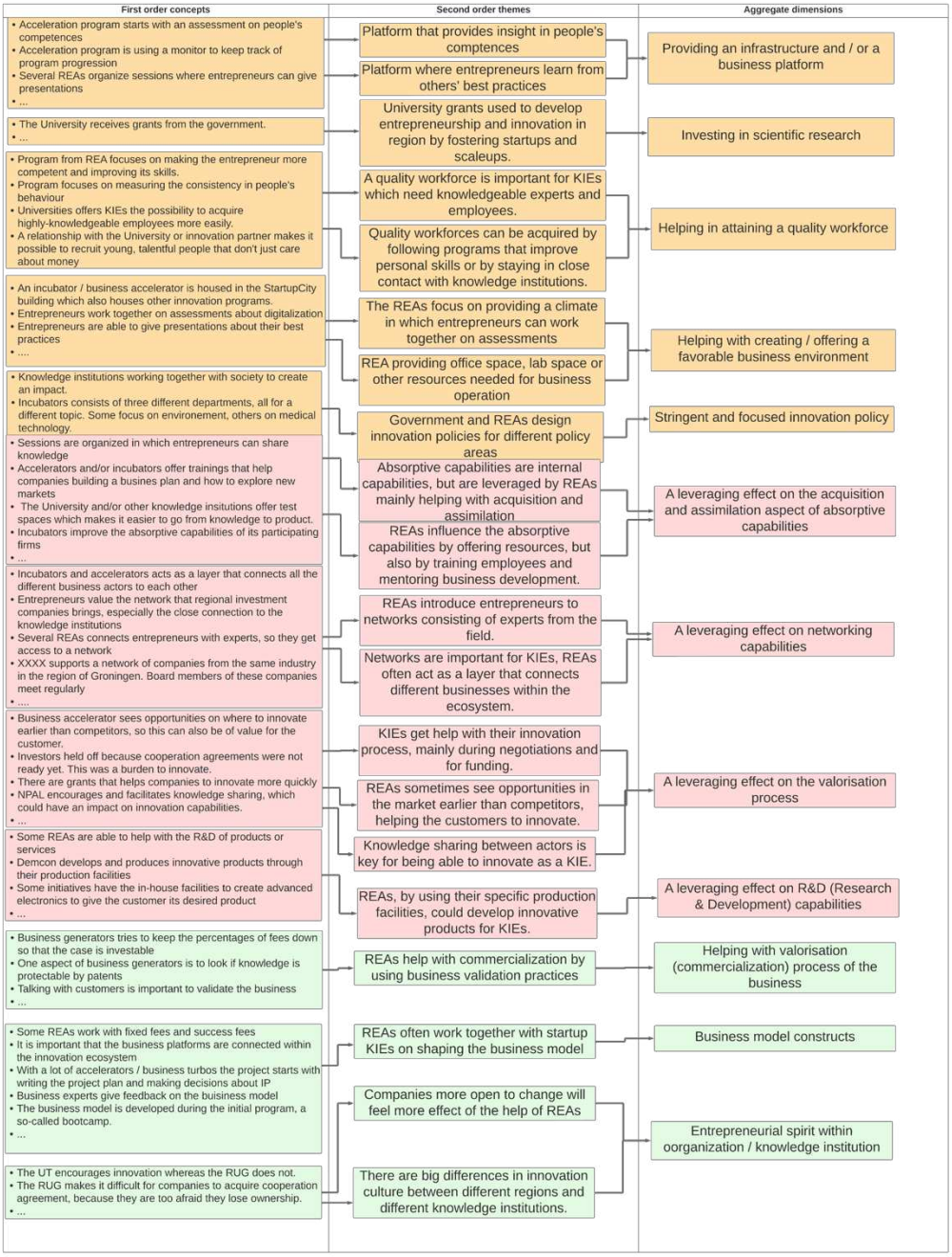

Figure 2: The interview code tree with first-order concepts, second-order themes, and aggregate dimensions[1].

The figure above depicts the code tree, structured around multiple primary aggregate dimensions. These dimensions were chosen to effectively categorize important quotes from interviews based on the tools used by the actors and their impact on dynamic capabilities.

The coding is done by using the Gioia method (Gioia, et al. 2012). This means that the first-order concepts will be the most specific concepts that are derived from the interview transcript. Next more general points can be derived from the first-order concepts which will

[1] Important to note is that not all first-order concepts are displayed. An Excel sheet with the full coding scheme is available upon request.

form the second-order themes. In the end, overarching concepts will be identified which will be classified as aggregate dimensions. All concepts which more or less belong to one class of categories are color-coded.

4.3 CODE EXAMPLES

Now that the general coding tree is displayed it is time to give examples from the Excel coding sheet. Coding examples will be given in the order that is displayed by the code tree.

4.3.1 Regional entrepreneurial actors

In the table below the aggregate dimensions corresponding to the color orange are displayed. In the second column, a quote from one of the transcripts is displayed. In the last and third columns, an explanation is given as to why this quote belongs to the specific aggregate dimension.

Aggregate dimension	Quote	Explanation
Providing an infrastructure and/or business platform.	Um, so at XX we have a funnel that you can call it for students or people who do have a business idea. And we have a program that's called the START Bootcamp. And the START Bootcamp is really aimed at, uh, people who do have an interest in entrepreneurship, but they don't have really an idea about what to do, how to take the next steps. So in a program of approximately three and a half hours, we take them through the basics of entrepreneurship. So we will talk about team, uh, team building, um, how to uh, create a value proposition, do some idea, selection idea, brainstorming techniques. Um, then we'll talk about the lean startup methodology, business modeling, different revenue models. And we, um, finalize the evening with some pitch training, and they have to pitch an idea of them by themselves.	This quote explains the infrastructure and business platform Company 5 provides to train his participants. The quote explains how the program works and how the program is structured.
Investing in scientific research	And it can be that the federal can give grants by the federal just to do, like. more on medical technology with all kind of universities related. And then you apply for debts in a grant. But it's not that we get just that. They say like, okay, we think the federalization is important. You always get 5 million already upfront to do whatever so we can on specific projects. You can times can get extra money from the federal government. But in basic the universities, every university, not only Twente, have to announce should cover their own federalization for a task.	This quote explains that the University could receive grants if they focus research in a certain area, which is an example of a regional entrepreneurial actor that invests in scientific research.
Help in attaining a quality workforce	Some are focusing on talent. Yeah, we had, I think one member here counted the number of projects in the region which are focusing on talent and labor markets and that were by the end of 2019, I think it were 170 projects. And that was highly fragmented, so there was no connection between them. So we also set up a new program which called the talent pact. So that's a sort of agreement, that sort of umbrella upon all these projects to intensify the cooperation between those all those projects. So that's another and which	This quote explains that the Company 4 focuses on keeping talented, high knowledgeable workers in the region stimulating quality workforce in the region.

	we strongly cooperate with various organizations. Also to help people like you, to stay here in Twente with the high knowledge to work here and to her and to also with relation to the through the potentials in the new market of,	
Helping with creating / offering a favorable business environment	We also benefited very much from the ecosystem that was established by the University and colleges. So we actually found our first and second office through there, where we were able to get a workspace.	This quote explains that Company 16 has benefited from the business environment that they were operating in. They were able to find their first and second office through the environment that they were operating in.
Stringent and focused innovation program	I want to run store, for example, together with citizens and Design Lab has with these research fellows, we have three focus areas, so we work on Citizen Science. So we help people like in the program, Top Citizen Lab, to make sure that we're connecting to different people within society and making it make sense for them, so that it's not all about, you know, our, let's say, language of research…	This quote explains the focus areas of the program, which says something about how stringent and focused the innovation program is.

Table 3: The aggregate dimensions" and a random quote with an explanation on why this dimension is chosen.

4.3.2 Dynamic capabilities

In the table below the aggregate dimensions will be discussed that are part of the elements highlighted in red. In the second column, an explanation will be given of why the quote belongs to the chosen aggregate dimension.

Aggregate dimension	Quote	Explanation
A effect on absorptive capabilities	Yes, I think what I just mentioned a little bit is: the access to well, the knowledge, but also to the people in schools and the access to yes, how to start your business, the knowledge that comes from experienced entrepreneurs. Also, certain that we will also see them again, something you don't realize is valuable until afterward. The theory and models are already available to build a business plan, for example. Then I'm talking about the theoretical models you can use to shape your business plan. Earlier we thought of yes, that's obvious, and if you just have access to that then you appreciate it less. But you notice anyway, as an entrepreneur you are constantly reinventing your business and constantly exploring new markets, seeing where you can jump in, should jump in. And yes, then those theoretical models keep coming back continuously.	This quote explains that the theoretical models during the program helped to shape the business; in other words, to learn how information can be acquired and assimilated, two aspects of absorptive capabilities. The REA offered access to the program that the entrepreneur participated in, in addition it learned the entrepreneur how to use the theoretical models, such as the Business Model Canvas in practice.
An leveraging effect on networking capabilities	So actually became a member of Incubate. Almost at the same time I took over the company. We did so. It was one year aniversary that we also	This quote explains that becoming a member of Incubate helped the

	announced it. And yeah, so they have of course a lot of connections in the region. But also it's just nice that there's a lot of startup there that you can talk to, discuss your ideas with and from each other. And yeah, also completely different terms, which is also nice. They right now also have once a month. I think they have Friday drinks where you can just meet everyone casually and then they also share the lessons learned. People pitch their own company or so really get to see. Yeah, what, what other ways to do things? And then just your, of course also have coaches. That that can help. Personally, I didn't use that much because myself we had about 13 investors with a lot of experience in our company. So mainly use the connections myself. But there's a lot of companies that also are physically, since we have our office personally in Angelo, was there some days to work there, but mostly to meet people.	participant to talk with others to discuss their ideas. It offered a network to the participant. The offering of a network could indirectly influence the networking capabilities.
An leveraging effect on the valorisation process	And yes, so that was quite a struggle actually to get that cooperation agreement. Now it is also true that we became our own entity because, it became too big as a project. And yes, then you also need money to be able to do something and then investors actually come around the corner very quickly and yes, you don't want that under the umbrella of VIEMR because you want to keep it loose. So that's why Company 16 was created, so investors could get on board.	This quote explains that it was hard for the company Company 16 to get a cooperation agreement with the UMCG. Therefore, the valorisation process of the company was disrupted and stagnated.
An leveraging effect on Research & Development capabilities	We can do that, we invite them to do that, and very often we ourselves are also in the lead and seek others ourselves, such that we can develop things together with these people. The owner Marlies, for example, who would really love, to name a cross street, to develop something that would allow you to get a hold of the microplastics that are now floating around everywhere but that doesn't necessarily have to do with paint, although paint contributes to that as well. But it, so it may also be stand-alone and then we look for partners with that, or partners come to us. Then we can develop things together, or we develop for them. You can. The hybrid model.	This quote explains that Company 15 helps the companies with the Research & Development of the product, and that the lab of Company 15 can be used to develop products; which could increase the R&D capabilities of the companies by learning from their practices.

Table 4: The aggregate dimensions belonging to the concepts in red and a random quote with explanation on why this theme is chosen.

4.3.3 Other capabilities

Aggregate dimensions	Quote	Explanation
Commercialization process of the business	. So the first thing is always just the market, because if there's no market needs well, yeah, yeah. Like, for example, another example that I could name and maybe I can put two companies together. So we have, Well Based, that I talked about this company. We also have another company that made respiratorie exercises, and they made a company out of that. So both more in the educational side of things. But the Respiratory Company did a B to C, so to the customers themselves. And you know, they said it to me to be through high schools for some and it's it's not necessary and B to B2B is better or B to C is better, but it's talking to your customers. And what is the best way that someone is willing to pay for your product? And in the end, the respiratory business failed because no customers individually would be willing to pay anybody, but also no health insurance company, for example, because it wasn't validated. So it is really understanding your customer, I think, in what they need..	Company 5 learns participants that a company should talk with their customers for business validation, which is part of the commercial process.
Business model constructs	So, for example, the Peng's gains model you have just the lean startup canvas. You have to have all these separate Canvas, that those are things that we do with our companies, so ourselves. We don't often recommend them writing a whole business plan of 20 plus pages, because we know that nobody reads it. But so there's some document of the source is required for a funding option that we have. So they could receive seed funding from us.	Company 5 helps with filling in the business model which could help with attracting funding.
Entrepreneurial spirit within organization / knowledge institution	The UT encourages innovation whereas the RUG does not.	Here, a quote from the transcript mentions that the UT is more entrepreneurial minded than the RUG.

Table 5: The concepts belonging to the aggregate dimension and its concepts in green and a random quote with an explanation on why this theme is chosen.

4.4 THEORY, RESULTS AND ITS PROPOSITIONS

The research explores the relationships between regional entrepreneurial actors and Knowledge-Intensive Enterprises (KIEs) within the entrepreneurial ecosystem. Propositions have been formulated to highlight the potential impact of these actors on various aspects of KIEs' growth and success. The propositions are based on the research framework presented earlier.

4.4.1 Networking capabilities

Regional entrepreneurial actors, such as incubators and accelerators, play a crucial role in providing KIEs with access to valuable networks. These actors focus on supporting start-ups and innovative companies, enabling KIEs to connect with diverse stakeholders. Within the network, KIEs gain access to relevant market information and customer engagement strategies. Moreover, knowledge transfer occurs, allowing entrepreneurs to learn from other actors in the network (Miles et al., 2006). Incubators and accelerators are very important for knowledge and technology transfer, promoting innovation processes (Vedovello, 1997; Bakouros et al., 2002). The interconnections between regional actors, KIEs, venture capitalists, and research institutions strengthen the ecosystem and accelerate KIEs' development (Chiara, 2014).

By giving KIEs or other companies that take part in an incubator or accelerator program the option to benefit from a large network, the company could be able to develop faster. Additionally, the company may develop its networking capabilities. Utilizing the network of regional entrepreneurial actors, KIEs can get in touch with new entrepreneurs and experts, indirectly improving their networking capabilities. Enhanced networking capacity leads to increased capacity for change, ultimately improving the valorisation process of KIEs.

During the research, a lot of evidence was found that this is indeed the case. Almost all actors that could be classified as regional entrepreneurial actors helped give the KIE access to a network. This happens in different ways and forms. Below it is discussed how the different actors offer the KIE a network, and what this network entails.

First, *Company 5* did this with their Technology Transfer Office. As found out during the interviews, *Company 5* possesses its own Technology Transfer Office which makes it possible to use scientific research as the basis for new startups. This is already a key finding; *Company 11* works together with *Company 5* to make research impactful by encouraging entrepreneurs to turn scientific research and ideas into products and services that can make a real impact. *Company 5* does this through its technology transfer office. The technology transfer office makes it possible for an entrepreneur that is working on a product, to get in contact with a researcher that is researching that specific topic. In this way, scientific research can be used as an input for business development. In other words, *Company 5* gives access to a network of researchers and entrepreneurs.

Second, *Company 2* also gives the KIE access to a network. According to a quote in the transcript: "*Company 2*' focus is connecting researchers". *Company 2* is founded by a team of company 11 employees. The goal of Company 2 is that researchers work together so they share their knowledge to increase the chance of creating something very groundbreaking. *Company 2* is the ecosystem that facilitates this working together. *Company 2* focuses on creating big new ideas. It is not leading the project, but it brings actors in contact with each other.

Third, *Company 4* also offers the KIE access to a network. *Company 4* is a regional entrepreneurial actor that is cooperating with 14 municipalities in the region to stimulate regional development. *Company 5* works together with *Company 4* to link entrepreneurs who are working on businesses with projects that are available in the *Company 4* portfolio. , *Company 4* can give the KIE access to a network since it introduces the company that is working on a project to other companies working on similar topics.

Fourth, *Company 8* is an initiative in the region of Twente that helps to connect students with (knowledge-intensive) companies. Student Power provides an online platform where companies can post jobs. Students are then able to apply for these jobs. In this way, Student Power gives the KIEs access to a network of highly knowledgeable students.

Fifth, *Company 12* is a regional entrepreneurial actor based in Groningen. *Company 12* is a 100 percent subsidiary of UMCG. *Company 12* is aimed at investing in high-risk activities that still need to be picked up by the market, but that can be useful for UMCG. Another key activity of *Company 12* is consulting. *Company 12* compares itself with OostNL and *Company 24*, but then on a small scale. Accelerating does not run programs like other accelerators do, because this is too “time-consuming”. *Company 12* does help entrepreneurs and companies with the help of external parties like the X with focuses on innovation in the Life, Science and Technology field. *Company 12* organizes the environment, with for example the X, in which those programs run. *Company 12* itself only invests in high-risk, high potential startups. According to *Company 12*, the main thing that people value a lot is “access to experienced people and grant money”. So, *Company 12* offers the companies a network of experienced people.

Sixth, *Company 13* is a regional entrepreneurial actor based in Groningen is functioning as an accelerator or pre-accelerator. *Company 13* helps people who have an ambitious entrepreneurship idea in a knowledge-intensive topic. The help of *Company 13* is twofold; first, *Company 13* helps with developing the business idea into a valid business model. Secondly, it coaches entrepreneurs to become more competent themselves. The networking aspect of *Company 13* is very important. During the program, the entrepreneurs are paired with all the people that are needed to execute the business plan. In other words, *Company 13* provides a network of experienced entrepreneurs or other experts who have the knowledge that is needed for that specific participant. In other words, the participant gets access to a network.

Seventh, *Company 14*, a regional entrepreneurial actor based in Groningen also offers their participants a network. *Company 14* is a foundation and provides an infrastructure for knowledge sharing and innovation. The foundation focuses on all the factories that are in the Northern part of the Netherlands. Board members from those factories are part of the director’s platform of *Company 14*. This director’s platform meets five times a year, and *Company 14* then organizes a program that is accompanied by a top speaker. This speaker tells something about a social economic topic, which could be energy transition or digitalization for example. It can be argued that *Company 14* creates a platform that provides the infrastructure for knowledge It introduces the KIE to a network consisting of all directors from production facilities in the Northern part of the Netherlands. In this setting, companies can learn from each other.

Next is the *Company 24*. *Company 24* also offers a network to the KIEs. According to *Company 24,* they facilitate innovations by investments and internationalization. With internationalization, it is meant that they bring foreign companies to the region and help Dutch companies with export facilities. *Company 24* also mentioned that the entrepreneurs

value the network that *Company 24* brings, especially being in close contact with the knowledge institutions.

The last regional entrepreneurial actor that offered the KIE a network is *Company 22* in Groningen. This institution is aimed at connecting, supporting, and promoting startups in the entrepreneurial ecosystem of Groningen. They stimulate startups to innovate with more impact and grow even faster. *Company 22* deems itself important for facilitating a network of entrepreneurs that are needed to start a business. One of the key elements of the network that *Company 22* brings is “recruiting and retaining talent that is needed to grow”. *Company 22* helps companies with networking capabilities since it offers entrepreneurs a network. This network helps with the commercialization process and promotes the valorisation process and scaling up since actors within this new network could provide help with getting investors ready and applying for grants. This support could help to overcome the financial barrier that KIEs face during their operational phase. In addition, networks could give the entrepreneur access to experts which could give the entrepreneur valuable new information that could leverage the acquisition aspect of absorptive capabilities, which could in turn influence the valorisation process. In addition, when an entrepreneur can learn from others’ best practices, this could also impact the valorisation process, made possible by having access to this new network offered by REAs.

Companies that are interviewed that agree on the fact that the KIE has helped with offering a network are for example *Company 1*. According to the interviewee, *Company 1* only made little use of new business. However, they did receive some minor help from developers from *Company 5* concerning business model strategies. Through *Company 11*, *Company 1* also got in contact with a mentor who could provide a lot of useful contacts, so this had a positive impact on the network that was available. *Company 1* argues that the contacts the network brought also could be used as a source of valuable new knowledge. This indicates that the networking capabilities also indirectly influence the absorptive capabilities.

Company 16, a company that is working in the energy sector also valued the network that *Company 13* has given them. Quote: “Through *Company 13* we did pick up some investments from different companies”. It continues; “This was mainly because Company 13 has introduced us to a network where we were able to pitch our story and introduce companies to the concept”. *Company 16* argues that “without this network, we were not able to grow so fast and bring our innovative product to the market so quickly”.

To conclude, the theory states that incubators and accelerators could help KIEs to benefit from their large network and thus get in contact with experts from the field, which leverages the conditions in which KIEs could improve their networking capabilities (Miles, et al. 2006). The interconnections between regional actors, KIEs, venture capitalists, and research institutions could also strengthen the ecosystem and accelerate KIE development (Chiara, 2014). This is in line with the findings. Almost all KIEs that were interviewed benefitted from a network that was brought to them through the REAs. This had certain advantages. It made it easier to turn scientific knowledge into commercialized goods, which impacted the valorisation process. Secondly, the network could also make it easier to get access to new information, which could impact the acquisition aspect of the absorptive capabilities. Thirdly, it could help with attracting a quality workforce, which could help with the assimilation of newly gathered information, thus also impacting the conditions of absorptive capabilities. Lastly, the network could provide easier access to venture capitalists or experts within this network could help with grant applications, which makes it easier for KIEs to overcome the financial barrier.

Based on theory and results the following propositions were phrased:

P1: The better the networking capabilities of a KIE firm, which are influenced by REAs, the better the valorisation process of KIEs.

P2: There is an interconnectedness between absorptive capabilities and networking capabilities, i.e. better networking capabilities enable a company to improve their absorptive capabilities.

4.4.2 Absorptive capabilities (acquisition of new knowledge)

Regional entrepreneurial actors facilitate the acquisition of new knowledge for KIEs. Interactions within the entrepreneurial ecosystem, guided by regional actors, promote knowledge exchange, idea-sharing, and collaboration among entrepreneurs, researchers, and industry experts (Bacon et al., 2019). Previous research supports that collaboration between regional actors leads to information sharing, driving innovation (de Vasconcelos et al., 2018). Additionally, knowledge institutions, as regional actors, contribute to knowledge transfer and acquisition through collaborations with entrepreneurs and research institutions (Budyldina, 2019). By supporting KIEs in acquiring new knowledge, regional actors enhance their absorptive capabilities, thereby fostering innovation.

If the regional entrepreneurial actor helps the KIE firm with the acquisition of new knowledge, it helps to drive innovation. New knowledge acquisition involves the acquisition aspect of the absorptive capabilities of KIE firms. REAs could provide access to relevant and novel information that can help to identify early signals and help to assimilate and guide this process by mentoring and monitoring. Important to note is that the REAs could not directly improve the absorptive capabilities, since this is an internal process, but the REAs could support the KIE in giving tools and guiding points to develop new routines, practices and blueprints. Initial findings supporting this proposition are evident in the Twente region.

The Technology Transfer Office serves as an example of a knowledge source, where *Company 11* collaborates closely with *Company 5* to leverage scientific research for launching new startups. As a result, this scientific research not only acts as a gateway to a new network but also as a valuable source of new knowledge. Moreover, *Company 5*'s strategic location on the University of Twente's campus indirectly facilitates the acquisition of new knowledge by fostering proximity to the source of knowledge. This pattern holds for all regional entrepreneurial actors that connect KIEs to dynamic networks, enabling them to get access to new knowledge through collaborative interactions within these networks.

Company 14, another regional actor, significantly contributes to new knowledge acquisition. The organization conducts thematic classes, providing a platform for diverse professionals from different organizations to engage in discussions, share challenges, and exchange knowledge. Additionally, *Company 14* arranges insightful company visits, allowing the participants to gain access to each other's work environments. The initiative further extends to inviting external experts who present cutting-edge topics and best practices, creating an environment conducive to absorbing new knowledge.

By embracing these knowledge-sharing principles, regional entrepreneurial actors emerge as catalysts in empowering KIEs with valuable insights, fostering a culture of continuous learning, and sustaining growth through the acquisition of novel knowledge.

To conclude, the theory states that REAs facilitate the acquisition of new knowledge for KIEs. Interactions within the entrepreneurial ecosystem, guided by regional actors, promote knowledge exchange, idea-sharing, and collaboration among entrepreneurs, researchers, and industry experts (Bacon et al., 2019). This is also verified during research. For example, an REA in Groningen organizes knowledge-sharing sessions with managers from the biggest production facilities in the region. During these sessions, KIEs can present important findings, such as new production techniques or other best practices which others can learn from. Additionally, company visits are arranged in which the managers can learn from practices in other production facilities. These sessions, organized by REAs, could lead to new insights, which could indirectly lead to new knowledge, and could have a positive impact on the valorisation process.

Based on the theory and results the following proposition was phrased:

P3: The better the absorptive capabilities, which could be leveraged by the REAs by making it easier to acquire new knowledge (acquisition), the better the valorisation process of a KIE firm.

4.4.3 Absorptive capabilities (quality workforce)

REAs could positively influence the quality workforce within the entrepreneurial ecosystem. By offering skill development programs and mentorship, actors like incubators and accelerators contribute to refining entrepreneurial skills and decision-making abilities (Stam, van de Ven, 2019; Politis et al., 2019). The support of regional actors helps entrepreneurs to learn from others' best practices, fostering the development of a competent, quality workforce. Moreover, collaborations between knowledge institutions and regional actors lead to tailored industry-specific training programs, ensuring a well-prepared workforce to meet the region's needs (Budyldina, 2019). An enhanced workforce indirectly influences KIEs' absorptive capabilities, further supporting the valorisation process.

A regional entrepreneurial actor creates a quality workforce by offering entrepreneurs the possibility to learn from others' best practices. On the other hand, the university also has a strong influence on the quality workforce in an entrepreneurial ecosystem. Regional entrepreneurial actors can work together with knowledge institutions to develop enhancements in the curriculum, offer internship programs, or offer industry-specific training programs for students. In this way, the knowledge institutions can make sure they offer job-ready graduates that meet the specific needs of industries in the region. This, in turn, makes it easier for companies in the ecosystem to find high-quality knowledgeable employees.

This theory can be supported when the results are analyzed. Findings from the region of Twente and Groningen support the support of REAs in creating a quality workforce.

Company 5 is the first actor that helps in creating a quality workforce. *Company 5*, as an accelerator, organizes boot camps in which entrepreneurs can improve their skills. *Company 5* is focusing on accelerating the business. This means that entrepreneurs with an idea can go to *Company 5*, where *Company 5* helps them through training and coaching sessions to develop the business idea into a good and working business model. The second actor that helps in creating a quality workforce is *Company 9*. According to the experiences of the interviewee, *Company 9* starts with low-key lectures about general entrepreneurialism. In addition, the interviewee mentions that *Company 9* helped in learning how to present an idea to a variety of people. The participant calls this the "most central valuable experience".

A regional entrepreneurial actor that has as its main focus on creating a quality workforce is *Company 10*. *Company 10* is an incubator program that supports self-development with the help of student coaches. It is a platform that provides all available resources and tools into an essential database. These resources can be used by trained student coaches to support other students in personal development. According to the information from the transcript, the main goal of *Company 10* is to help with self-development. For example, it teaches students, that are developing a business, to deal with stress-related symptoms. It can be argued that *Company 10* focuses on creating a "quality workforce"

Company 13, located in Groningen also influences the quality workforce. During the acceleration program of *Company 13*, an assessment will be carried out to find out where people's competencies lie. Here, the participant is also asked which function in a business they would like to fulfill. When the profile is clear, *Company 13* can focus on what needs to be learned. In addition, during the program it is measured how consistent people are in their behavior; this is an important predictor of success.

As can be seen already, the programs that *Company 13* offers focus on the area of personal development. Personal development leads to quality workforce.

Company 24 tries to influence quality workforce by organizing pitch camps and pitch competitions. In addition, *Company 24* organizes pitch camps and pitch competitions. During these pitch camps and competitions, the entrepreneur learns how to do a good pitch. In other words, *Company 24* helps with the personal development of the entrepreneur.

A company that was interviewed, *Company 1* also verified that the regional entrepreneurial actor has helped in attaining a quality workforce. She mentioned the help of . *Company 1* is a startup that made use of the support of regional entrepreneurial actors. *Company 1* is a company that created a platform that makes sustainability impact data available to consumers. It makes it possible to get insight into the personal impact on sustainability. In addition, the customer can compensate for the environmental footprint with the help of offsetting companies. This company was developed with the help of the UT Company 9. A quote that resembles the importance of participating in *Company 9* is: "Being able to create a startup while being connected to the University of Twente, gives access to young, talented students." Continues "Students are eager to work for actual companies instead of doing a project". Here, the interviewee mentions that *Company 9* has helped her company in attaining a quality workforce, which has a positive influence on the absorptive dynamic capability, as can be seen in the research framework. Another quote that justifies this statement: "The University is a great place to recruit young, talentful people". She continues "They don't just care about money; they want to learn and do better for the environment".

Another company that verified that the regional entrepreneurial actors indeed helped with attaining a quality workforce is *Company 16*. *Company 16* is an innovative knowledge-intensive IT company. *Company 16* has developed a platform that makes it possible to regulate and control energy smartly. Because the company has participated in such accelerator programs and did presentations at schools and universities it also made it possible to attract new talent. According to the interviewee, "Being close to the talent allows for easy access to talented people, which results in knowledgeable future employees".

oTo conclude, the theory states that REAs could positively influence the quality workforce within the entrepreneurial ecosystem. By offering skill development programs and mentorship, actors like incubators and accelerators contribute to refining entrepreneurial skills and decision-making abilities (Stam, van de Ven, 2019; Politis et al., 2019). The support of regional actors helps entrepreneurs to learn from others' best practices, fostering the development of a competent, quality workforce. This is indeed verified during research. A lot of REAs have built tools and programs to support entrepreneurs active in a KIE with the self-development process to become a better entrepreneur. This is focused on creating the right Business Model Canvas, getting to know yourself better, or acquiring new (managing) skills that could be useful to exploit business. In addition, since REAs often have close contact with knowledge institutions (Novel-T to UT and VentureLab to RUG), KIEs have access to a great pool of talented workforce, which could lead to better-qualified employees which could positively impact the assimilation of knowledge and thus the valorization process.

Based on the theory and the results, the following propositions were phrased:

P4: The higher the absorptive capabilities, which could be leveraged by the REAs by offering them easier access to a quality workforce (assimilation), the better the valorisation process of a KIE firm.

P5: The REAs, through their innovation programs, try to improve the skill set of humans which leads to a higher quality workforce.

4.4.4 Absorptive capabilities (investment in scientific research)

Regional entrepreneurial actors, including knowledge institutions and accelerators, invest in scientific research to foster innovation within the ecosystem. Knowledge institutions provide research grants and establish dedicated research centers, driving innovation through research activities (David & Metcalfe, 2007). Accelerators may focus their investments on research relevant to specific sectors, aligning with the startups they support (Cohen, 2013). These investments contribute to the creation of new knowledge and innovations, benefiting the entire entrepreneurial ecosystem.

A regional entrepreneurial actor is present in the entrepreneurial ecosystem. Investments are essential for the functioning of the entrepreneurial ecosystem. These investments could be divided into two categories. The first investments are investments in the knowledge base, whereas the second category consists of targeted investments. This could be investments for research facilities and valorization activities for educational institutions (Gov of Netherlands, 2021). Innovative startups and scale-ups are essential to generate new knowledge and innovations within the ecosystem. Regional actors, such as knowledge institutions, venture capitalists, incubators, and accelerators can invest in scientific research. First, knowledge institutions can invest in scientific research in three different ways. They can provide research grants which can be used by researchers to conduct research projects. In addition, universities often consist of research centers that are dedicated to specific areas of scientific research. These centers receive EU funding and resources to conduct scientific research that contributes to the entrepreneurial ecosystem (David & Metcalfe, 2007). In addition, accelerators can also invest in scientific research. Accelerators that are focused on specific industries may invest in scientific research that is relevant to the specific sector. For example, there are accelerators focused on accelerating biotechnological startups, they could invest in research projects related to biomedical advancements. In addition, incubators and accelerators can also offer financial support to startups that are engaged in scientific

research or conduct research to create new technological products (Cohen, 2013). This funding is mainly aimed at acquiring the necessary resources, equipment, and expertise for research activities.

In the region of Twente, the University of Twente invests in scientific research. The body of this institution is to create knowledge and invest in scientific research. In addition, the knowledge institutions focus on investing in students and staff who will do research.

A regional entrepreneurial actor that invests in scientific research is *Company 12*. Company 12 is a 100 percent subsidiary of the hospital in the northern Netherlands. *Company 12* is aimed at investing in high-risk activities that still need to be picked up by the market, but that can be useful for the hospital in the northern part of the Netherlands. Another key activity of Company 12 is consulting. *Company 12* does not run programs like other accelerators do, because this is too “time-consuming”. *Company 12* does help entrepreneurs and companies with the help of external parties like the X which focuses on innovation in the Life, Science and Technology field. *Company 12* organizes the environment, with for example the X, in which those programs run. *Company 12* itself only invests in high-risk, high-potential startups. Company 12 has three different programs. The developers create an initial recommendation, that is not shared with the entrepreneur, but with the panel from *Company 12*. This panel consists of at least five experienced companies that can give useful advice to such startups. This advice is only available for the panel until the panel says that it is interesting. When this is the case, the entrepreneur is invited to a conversation with the panel, and that is also the moment that the formal advice is formed. When the advice is positive, *Company 12* also supports the company financially. The financial support that is given is meant for conducting biomedical research to create the product.

In conclusion, the theory states that investments in scientific research could impose different goals. First, investments in scientific research could be aimed at broadening the knowledge base, but can also be aimed at turning scientific research into commercialized goods, creating a purpose for the end-consumer or the field in which the REA operates. In Twente and Groningen, evidence is found that REAs are active in the ecosystem and invest in startups that are operating in the same sector. For example, *Company 12* is closely connected to the hospital in Groningen and is constantly searching for knowledge-intensive startups with valuable ideas that could be used in the medical sector. Investments in scientific research could help KIEs to overcome the financial barrier they face, enabling them to turn their information into knowledge, and knowledge into goods, leveraging the conditions in which KIEs could improve their absorptive capabilities. In addition, an REA could leverage the conditions in which KIEs could improve their absorptive capabilities if scientific investments yield new, valuable information, which is focused on the assimilation aspect of absorptive capabilities.

Based on the theory and the results the following propositions were phrased:

P6: Investments in scientific research could leverage the absorptive capabilities of KIE firms if novel information is gathered.

Here, P6 and P7 are linked. So, because of the existence of proposition six, proposition seven is also true. If the company indeed can improve its absorptive capabilities, this will have a positive impact on the valorisation process of the KIE.

P7: Investments in scientific research that leverage the absorptive capabilities, will also have a positive impact on the valorisation process of a KIE firm.

4.4.5 Research & Development capabilities

The practice of open innovation and co-creation within the entrepreneurial ecosystem allows regional entrepreneurial actors to support KIEs' Research and Development (R&D). By engaging in collaborative R&D projects, actors contribute to KIEs' R&D capabilities and the development of innovative products and services (Chesbrough, 2006). Co-creation and learning from others' practices enable KIEs to improve their R&D capabilities through active participation in the process.

A regional entrepreneurial actor could support KIE with R&D if the entrepreneurial ecosystem is using open innovation and co-creation. Open innovation in ecosystems exists when actors interact to create value by co-creation. Therefore, the innovation ecosystem must provide an integral and flexible structure that yields flexible relationships (Lusch, Nambisan, 2015). Normally, businesses develop and commercialize products and services with internal knowledge and capabilities. This way of working is known as closed innovation. However, nowadays, in current innovation ecosystems, the open innovation paradigm has emerged. Open innovation is the opposite of traditional innovation. In traditional innovation, experts are working in specific areas inside the company commonly called R&D, dedicated to creating new products and services. Open innovation is different in this regard. Open innovation starts with opening the company and looking for experts outside the innovation ecosystem without trying to place them inside the organization. Open innovation is “the use of purposive inflows and outflows of knowledge to accelerate innovation and expand the markets for external use of innovation” (Chesbrough, 2006). Because open innovation is used in innovation ecosystems, actors in the ecosystem could do the R&D for other knowledge-intensive companies that seek external help in this area. It could be argued that by co-creation and learning from others’ practices that the KIE can improve its R&D capabilities if the company itself is involved in the process.

A regional entrepreneurial actor can indeed provide valuable support for the Research and Development (R&D) endeavors of Knowledge-Intensive Entities (KIEs). Some noteworthy regional actors that play an active role in facilitating R&D activities are discussed below.

Firstly, *Company 2* in Twente emerges as a prominent regional entrepreneurial actor that aids KIEs in their R&D. This innovative hub offers essential resources, empowering entrepreneurs, researchers, and students to create and test prototypes, develop new products, and foster innovation. One noteworthy resource offered by *Company 2* is the laser cutter, which proves instrumental in the R&D process, enabling precise and efficient product development.

Additionally, the InnoLab initiative in Groningen emerges as another valuable supporter of R&D activities. The InnoLabs in Groningen focuses on making lab facilities available for diverse engineering aspects, thereby improving the R&D capabilities of KIEs in the region.

Furthermore, *Company 15*, located in Groningen represents a dynamic regional actor aimed at supporting R&D efforts. Realizing the potential of its lab next to just making coatings, *Company 15* believes in a broader innovation journey. Situated on the Zernike Campus, *Company 15* strategically leverages the presence of knowledgeable scientists around the university, making it of vital importance for the biobased economy. Consequently, Company 15 offers valuable assistance to entrepreneurs, aiding in the development of products across diverse sectors, fueled by innovative ideas and promising scientific research.

Company 15 actively collaborates with entrepreneurs and researchers, transforming their inventive concepts into tangible products. Entrepreneurs can engage with *Company 15*,

initiating a crucial first meeting to assess mutual compatibility. Following this, both parties identify areas of synergy, paving the way for developing an extensive project plan. Moreover, *Company 15* extends its support to the grant application procedure. However, it is important to note that *Company 15* charges commercial rates for its expert guidance. Upon project plan approval, entrepreneurs benefit from using *Company 15's* in-house labs for product development, expediting the R&D process.

Another impactful company in this domain is *Company 15*, known for developing and producing innovative systems. Entrepreneurs can approach *Company 15* with specific system requirements, such as faster or more accurate systems. *Company 15* possesses the necessary in-house resources and expertise to bring these ideas to real-life products through efficient and focused R&D efforts. Remarkably, *Company 15's* commitment to innovation ensures that most projects are completed within three months, with products collaboratively developed with the customer. In essence, *Company 15* plays a crucial role in supporting R&D initiatives by actively collaborating with KIEs and addressing their unique product needs.

In conclusion, the theory states that by engaging in collaborative R&D projects, actors contribute to KIEs' R&D capabilities and the development of innovative products and services (Chesbrough, 2006). Co-creation and learning from others' practices enable KIEs to improve their R&D capabilities through active participation in the process. This seems indeed true, several initiatives from both ecosystems could help the KIE with the R&D of their proposed product or service. They do this if the KIE does not have the production facilities in-house to produce the products themselves. Sometimes they even take over the whole production process in return for financial compensation. Other initiatives focus on providing essential resources, such as lab space, or renting production resources, such as specialized machinery. In this way, the REA could support the R&D process, and thus impact the valorisation process of the KIE, helping to overcome an R&D barrier.

Based on the theory and the results the following proposition was phrased:

P8: The support of REAs with the R&D of products and services has a positive impact on the growth and valorisation process of KIEs.

4.4.6 A favorable business environment

Regional entrepreneurial actors, such as incubators, accelerators, and universities, offer essential resources to enable KIEs to execute their businesses effectively. Providing physical spaces, mentorship, and access to facilities, these actors create a favorable business environment for KIEs (Woolley & McGregor, 2021). This environment indirectly influences KIEs' dynamic capabilities, supporting their innovation efforts and overall success within the entrepreneurial ecosystem.

A regional entrepreneurial actor is involved in the entrepreneurial ecosystem. This means that the actors also work to realize the entrepreneurial ecosystem. The entrepreneurs participating in the entrepreneurial ecosystem are sitting at the center of the system. In this position, they are best placed to respond to signals from the marketplace. The benefit of participating in an entrepreneurial ecosystem is that companies can sell their products to customers in the network, and they can buy products from suppliers that are in the ecosystem. In addition, companies can foster innovation by drawing on the know-how and resources of several other groups of actors also participating in the system. The entrepreneurial ecosystem community works in a set of framework conditions that are defined by policymakers and regulators. So, in this way, the actors offer the entrepreneur to

become part of the “entrepreneurial ecosystem”, where this ecosystem offers the entrepreneurs a favorable business environment to execute business and be able to innovate more quickly and with more impact (InterTradeIreland, 2012).
On the more practical side, incubators, accelerators, and universities, which are all regional entrepreneurial actors could offer resources to entrepreneurs. Often these actors possess physical resources, such as working spaces or office spaces. The facilities that are offered by regional entrepreneurial actors can also be seen as resources that help create a favorable business environment (Woolley & McGregor, 2021). It could be the case that these resources help improve the valorisation process since the company gets the resources, they need to innovate.

The Kennispark area stands out as a favorable business environment. Collaborating with the University of Twente, the province of Overijssel, *Company 11,* University, the non-profit foundation "Kennispark" concentrates innovative companies in a specific location. This ecosystem encourages knowledge sharing among companies and facilitates networking among entrepreneurs, leading to the emergence of knowledge-intensive spinoffs and startups.

Company 4, a cooperation between 14 municipalities and knowledge institutions, actively promotes innovation and regional development. Leveraging a region deal introduced in 2019, *Company 4* provides public subsidies for investing in various innovative projects across different sectors. Their focus on projects in line with the region's strategic position, such as circular economy and health care, contributes to an entrepreneurial ecosystem. As an important partner, *Company 5* links entrepreneurs to *Company 4*'s portfolio, fostering collaboration and accelerating innovation in the Twente region.

Company 9, initiated by *Company 5*, UT, and *Company 2*, plays a significant role in creating a favorable business environment. The challenge emphasizes a practical, project-based approach to developing highly valuable business ideas. Participants receive constant feedback and mentoring on their projects, leading to exposure within the University and other academic circles. This fosters an environment for inspiring entrepreneurs and enhances the valorisation process.

Company 21, a regional entrepreneurial actor in Groningen, provides a favorable business environment by operating the largest production facility of agrifood and establishing an Innovation Center. The center collaborates with partners in the agri-food industry, co-creating and innovating together. Moreover, *Company 21's* physical building offers space for startups, enabling them to utilize *Company 21's* facilities. Their close connections with knowledge institutions ensure access to highly knowledgeable talent.

Company 12, an accelerator based in Groningen, contributes to a favorable business environment by being housed in the StartupCity building on the Zernike Campus. The campus also hosts other innovative programs and InnoLabs, providing a comprehensive ecosystem that nurtures startups and entrepreneurs. Additionally, Campus Groningen, a real-estate company on the campus, offers facilities to support businesses, further enhancing the environment.

Furthermore, *Company 16*, a previously discussed company, highlights the value of the favorable business environment provided by regional entrepreneurial actors. Leveraging *Company 12* during their business development phase, *Company 16* experienced substantial support in shaping their business. This illustrates the significance of the ecosystem created around knowledge institutions, as quoted: "Through the business environment called Zernike Campus, we have found our first and second office."

To conclude, the theory states that incubators and accelerators could help by providing resources to make business execution easier (Woolley & McGregor, 2021). In addition, being part of an entrepreneurial ecosystem could improve the ability of a KIE to respond to market signals (InterTradeIreland, 2012). This is indeed also verified in the region of Groningen and Twente. In Twente, the Kennispark region is supported by REAs, such as NovelT to create a favorable business environment with close ties to knowledge institutions and other innovative companies. By concentrating these companies in one ecosystem, knowledge sharing is encouraged, leading to more knowledge-intensive spinoffs and startups. In Groningen the same holds for Campus Groningen, however, fewer startups and spinoffs are located there when compared to Twente (190 vs 400). These business environments, strongly supported by REAs, could also lead to companies acquiring office space, machinery, test spaces which could improve the valorisation process of KIEs.

Based on the theory and the results the following proposition was phrased:

P9: A regional entrepreneurial actor offers the KIE the resources that are needed to execute business, which improves the valorisation process of those firms.

5. CONCLUSION AND DISCUSSION

In this chapter, the conclusion of the study is described. The first part of the chapter examines the conclusion on the results, based on the propositions described in the previous section. Afterward, there is a discussion section that also includes the limitations of this study and also imposes some recommendations for future research. At the end of the chapter, the practical implications of the study will be discussed.

5.1 CONCLUSION

The primary focus of this research was threefold. First, an understanding of how regional entrepreneurial actors (REAs) can effectively support Knowledge-Intensive Enterprises (KIEs) needed to be gathered. The second objective was to get a clear understanding of the mediating effect of dynamic capabilities on this support and the innovation capability of KIE firms. Third, it tries to get an understanding of the impact of REAs' support on a regional level, by comparing two different regions. The concept of support provided by these actors encompasses various aspects that could impact the innovative capabilities of a firm (Panatakul & Pinto, 2014). These factors include a favorable business environment, investment in scientific research, access to a quality workforce, assistance in acquiring new knowledge, networking with experts, and aid with Research & Development (R&D). To delve into these aspects, the research was structured around nine propositions, as highlighted in the previous section.

First, networks and networking capabilities. During the research, we found out that the REAs indeed give the company access to a network. Almost in all cases, the REA provided a network to the KIEs. The network offered had a positive effect on the valorisation process of firms. In most cases, the network was provided by incubators and accelerators which offered a network consisting of experts that could help the business to develop more quickly (Chiara, 2014). According to this research, it can be concluded that the network offered by REAs is the most important aspect of support. The network supported the KIEs in three different ways. First, and most obvious, by being able to get help from experts within the network, companies were able to execute business and accelerate innovation. Besides, getting access to networks, through the support of REAs, the KIEs could get to know suppliers and potential buyers. This makes it easier for those companies to find the prospective market and sell their product. A startup could fail if it cannot find enough customers for its product (Gbadegeshin, et al. 2022). This could help overcome one of the aspects of the Valley of Death (VoD). Thirdly, it could be argued that giving access to a network could also improve the networking capabilities of the firm. As earlier discussed, networking capabilities describe the ability to build, handle, and exploit relationships (Vesalainen & Hakala, 2014). This could be relationships with all different shareholders. It could be argued that if the company gets access to a network through an REA, it can also improve its networking capabilities because it has some holding points to build its network. In short, REAs offer the KIEs an infrastructure and business platform that consists of networks of a talented pool of experts. This could have an indirect effect on the networking capabilities, which in turn, has a positive effect on the valorisation process of KIE firms. It can be concluded that without REA support, it is a lot harder for KIEs to join a network, which makes them more likely to fail.

Next, REA support entails more than only support with networks and networking capabilities. The REA also helps with the acquisition of new knowledge. A lot of REAs have close connections with knowledge institutions. Some REAs have the goal to use new scientific

research as the basis for new startups. They actively search for entrepreneurs who are available to turn this scientific research into a product or service. In this way, REAs support the entrepreneurial ecosystem and its activities by persuading entrepreneurs to use new knowledge for more innovative products or services. In addition, REAs often offer platforms in which knowledge sharing is facilitated. It could be argued that knowledge-sharing could have a positive leveraging effect on the absorptive capabilities, and thus on the valorisation process of a firm. The absorptive capabilities include the ability to recognize, identify, and assimilate new information (Cohen & Levinthal, 1990). It could be the case that the company can improve its absorptive capabilities because the company is acquiring new knowledge with some help from the REA. It could be that the entrepreneur can learn from the practices of others and therefore could improve its absorptive capabilities. Without the business platforms that are offered by REAs, knowledge-sharing would become harder. For instance, for startup KIEs, it is harder to get in contact with bigger companies from the same industry. By enabling knowledge-sharing through these platforms, the threshold of getting in contact with each other is lower, leading to more innovative products for the industry.

Thirdly, the REA can support the entrepreneur with a quality workforce. This is true in two different ways. First, a lot of regional entrepreneurial actors are focused on improving the skill set of the entrepreneur by offering training. These trainings are focused on the skill set of an entrepreneur and are often given in classroom situations. Almost all actors in the ecosystem focus on self-development. These training and coaching sessions are a great example of how the REA supports a quality workforce. Another way the actors support a quality workforce is by making a quality workforce available for the company. For example, when the entrepreneur is closely connected to a knowledge institution, it is close to the source of talent which makes it easier to attain a quality workforce. Multiple quotes from companies that are doing business in the entrepreneurial ecosystem verify this. Access to a quality workforce could have a positive impact on absorptive and R&D capabilities because knowledgeable employees could be better at assimilating and identifying knowledge. It could be argued that improving the skill set of the entrepreneur is an essential support part of REAs. Without this support, KIEs are a lot more likely to be trapped in the VoD because they often lack a clear business vision. Improving the workforce could have a positive leveraging effect on the development of every dynamic capability within the company, it could have a positive effect on the “openness”, “willingness”, and “ability” to change paradigms.

Fourth, the REAs invest in scientific research. Some actors are investing in scientific research, some in a direct way, others in an indirect way. Investments are essential for an entrepreneurial ecosystem. It could be argued that the knowledge institutions are regional entrepreneurial actors and that their investment in scientific research is evident. This could be investments in research facilities and valorization activities. This is indeed the case for the entrepreneurial ecosystem in Twente and Groningen. In addition, accelerators and business incubators sometimes also invest in scientific research, if the research field matches the interests of the incubator and accelerator. According to Gbadegeshin (2021), running out of money is one of the main reasons why KIEs still fail. Investments in KIEs that use scientific knowledge as the basis for their products, could help overcome this problem. Investment in scientific research yields new knowledge that could have a positive leveraging impact on the acquisition and assimilation aspect of absorptive capabilities, and thus indirectly on the valorisation process.

Fifth, a lot of regional actors in the entrepreneurial ecosystem can help with the R&D of the proposed product or service. Some actors offer resources that are aimed at supporting R&D, for example, production facilities. Other actors take over the R&D from the KIEs. So, it could be concluded that the regional entrepreneurial actors are focused on helping to develop the

product. It could be argued that if a regional entrepreneurial actor supports the entrepreneur with Research and Development it is also able to improve its R&D capabilities. If the entrepreneur is closely working together with the entrepreneurial actors, he or she might be able to learn from these actors. If this is true, then the entrepreneur might be able to develop the products in-house the next time. Again, it could be the case that this is true, as it might be up for discussion.

Lastly, the entrepreneurial ecosystem is created by the entrepreneurial actors. In Twente a favorable business environment is realized as the Kennispark area. This area concentrates a lot of innovative companies. This concentration should lead to knowledge sharing between companies. It could be argued that this is an example of a favorable business environment since companies have easier access to knowledge. Entrepreneurs value the fact that regional entrepreneurial actors are part of the entrepreneurial ecosystem. The actors help the company to shape the business but also provide resources. Mainly, regional entrepreneurial actors provide a favorable business environment with good connections to networks, facilities, office spaces, and other important resources. This favorable business environment makes it easier for KIEs to operate and grow, and therefore also has a positive impact on the valorisation process.

To conclude, it has become clear that regional entrepreneurial actors can support Knowledge-Intensive Firms in a lot of different ways. The focus of the actors is to help the company with developing a business idea into a mature business model. Actors do this by offering the companies access to networks that could consist of potential buyers, suppliers, and experts. Next, they can offer resources such as offices, buildings, and other resources that are useful for the company to expand. Some actors are also able to R&D the product or service for the company that is seeking help with R&D. Most of this support has a positive leveraging impact on the dynamic capabilities of firms, indirectly improving the valorisation process. The support also triggers an effect between the dynamic capabilities, affecting each other. In contrast to the framework by Patanakul & Pinto, the mediating effect of the dynamic capabilities is clear now. It could be concluded that the main reasons why KIEs fail, reasons listed in the VoD, are tackled or minimized by the support of REAs. Mainly, the companies benefit from the entrepreneurial ecosystem and its corresponding actors. By focusing actors around one specific area, such as Kennispark and Zernike Campus, companies have access to these actors, and lines to knowledge are short. It could be argued that this multi-area support also leverages the conditions in which firms can improve their dynamic capabilities. The help with R&D originating from regional actors could influence the R&D capabilities of the company if the actors give the possibility to learn during this process. The same holds for networking capabilities. If the company is gaining access to a network with help from the REA, it possibly could use these resources to build its network. The support of REAs on KIEs has a bigger effect on the valorisation process of these companies if they are open to change. However, one must note that the experienced support could differ from the region in which the company operates. KIEs operating in regions that stimulate innovation greatly, often experience greater and more impactful support from REAs. Lastly, the impact of REA support also depends on the internal dynamic capabilities the firm already possesses. The better developed, the higher the impact of REA support.

5.2 DISCUSSION

During the research, interesting information about the entrepreneurial ecosystem in Groningen and Twente was found. Ecosystem differences could be very interesting, if generalizable.

The entrepreneurial ecosystem in Twente is supported by the UT. The UT as a knowledge institution encourages an innovative and entrepreneurial climate around the university and the region of Twente. The Rijksuniversiteit Groningen is stimulating innovation less than the UT does, which can also be seen when comparing the number of spin-offs. In Groningen, there is a little lack of leadership in the region's entrepreneurial ecosystem. Out of necessity, this role is taken over by the government where the University could maybe have taken this role. The entrepreneurial ecosystem in Groningen consists of more disconnected actors. The cause of this disconnection is threefold; there is a lack of clear vision in the region, the cooperation between the actors is lacking, and according to the actors, the University is not encouraging the innovative landscape as the UT does. (Broekhuizen & Roos, 2021). This lack of the University in Groningen becomes clear when actors complain about the fact that the RUG is not supporting entrepreneurs as they would wish. A conclusion to these regional differences is that the support of REAs could be experienced differently by KIEs operating in different regions. It could be that the support of REAs has a bigger influence on the success and growth rate of KIEs in a region than in a different region. This depends on the support of innovation of the ecosystem actors in general. It could be argued that entrepreneurs in Twente experience stronger support from REAs than in Groningen, due to the difference in the amount of "willingness to change" experienced in the region.

5.2.1 Practical Implications

Another interesting, but not fully related, topic is the ecosystem differences. During the research, several papers were collected. These papers, primarily derived from interviews, delve into the shortcomings of the entrepreneurial ecosystem in Groningen, shedding light on the challenges faced by the region. Within this context, we also present the most critical findings from these papers, offering valuable insights for exploring potential differences in the support provided by regional actors.

The report titled "Conditions for Regional Innovation" tries to research the underlying factors behind the relatively slow pace of innovation among companies in the Northern part of the Netherlands. To gain a deeper understanding, the study engaged with diverse stakeholders, including CEOs and experts representing various sectors. From these interactions, the following critical aspects were identified as significant obstacles to regional innovation:

Tight labor market:

A prominent challenge in fostering innovation is the lack of qualified, technical employees. This issue can potentially disrupt future innovation prospects, as the availability of suitable talent is essential for successfully implementing and driving innovations. To address this challenge, the COMPANY 14 emphasizes the need for the University of Groningen (RUG) and the Universities of Applied Sciences to play a more substantial role in nurturing and providing a high-quality workforce. Furthermore, the region can better capitalize on its highly knowledgeable ecosystem by fostering greater collaboration among these knowledge institutions.

Resources not coordinated:

The report highlights the importance of taking an integral approach to major themes, aiming to encourage greater cooperation among stakeholders and thereby boost innovation traction. The current practice of unique criteria for each subsidy application often leads to uncertainty regarding the potential approval of complementary subsidies. This lack of coordination has the potential to stifle innovation possibilities within the region of Groningen.

Lack of vision:

The Northern Netherlands requires a more comprehensive and integrated vision and strategy that addresses the various parties working on specific themes such as agri-food, health, and climate. The current organizational landscape is deemed insufficient, necessitating the establishment of additional development facilities in the region to foster innovation and growth effectively.

Another report concludes that the urgency to foster innovation is present among regional entrepreneurial actors, yet this sense of urgency often fails to penetrate to the SMEs, necessitating more active and effective mutual coordination and cooperation among stakeholders (Broekhuizen & Roos, 2021). In addition, the presence of a diverse array of regional entrepreneurial actors is beneficial for the region, with experts claiming that there are no apparent blind spots. However, the existing lack of cooperation among these initiatives restricts SMEs from gaining a clear and comprehensive view of the overall innovation landscape.

While government entities take the lead in shaping the entrepreneurial ecosystem, other key partners often experience a lack of strong leadership. This discrepancy highlights the importance of robust leadership with a clear vision and defined goals, an essential factor for successful entrepreneurial ecosystems. The presence of enough talent in the region is a promising sign, with knowledge institutions playing a vital role in attracting and cultivating skilled individuals. However, there remains scope for improvement in retaining talents from categories that are scarce in student numbers.

A big difference in the entrepreneurial ecosystems can be discovered here. Where the UT encourages an innovative and entrepreneurial climate around the university and the region of Twente, the RUG is falling a little bit behind in the lead in making the region innovative and entrepreneurial. The findings of the interviews (about the entrepreneurial ecosystem in the northern region) align with the two reports collected. Broekhuizen & Roos also conclude that there is a lack of leadership in the region's entrepreneurial ecosystem. This role is, out of necessity, taken over by the government, whereas the knowledge institutions could have taken this leading role. This is also in line with the findings from Company 14, where they argue that there is a lack of vision in the northern region and that the organization is insufficient.

According to the report from Company 14, the resources in the northern part of the Netherlands are not coordinated enough. It is argued that better coordination and cooperation result in more traction in innovation and, therefore, a more innovative ecosystem. This is also concluded by Broekhuizen & Roos and could also be seen in the interview transcripts. The regional entrepreneurial actors in the northern part of the Netherlands need to be more streamlined and work together. The initiatives in the northern region are more disconnected than in the Twente region. The cause of this is threefold: a lack of clear vision in the region, bad cooperation between the initiatives, and a university that, in the eyes of the companies and regional entrepreneurial actors, is discouraging the innovative landscape. If more generalizable results could be yielded by exploring innovation

ecosystems in different countries, this could function as an important practical implication and could also be used for future research.

5.2.2 Research Limitations & Future Research Recommendations

There are limitations concerning the research that need to be discussed. First, the balance between KIEs and entrepreneurial actors is skewed. In total, more interviews are conducted with entrepreneurial actors than with companies. This could harm the statistical power of the study. In future research, a better balance between KIEs and REAs could make data less skewed.

The next limitation is the methodology of the research. The idea of the research was to survey with KIEs and actors to get to know, in a quantitative manner, if companies had had support from regional entrepreneurial actors. During the research, I found out that it was very genot interested and invested enough to fill in the survey. A survey causes too much distance between the company that is surveyed and the researcher. Therefore, it was chosen to switch to conducting interviews. This also resulted in a switch from mixed-method quantitative/qualitative research to purely qualitative. In general, the limitations of qualitative research are that the quality of the research is mainly dependent on the skills of the researcher and that it is harder to maintain rigor with qualitative research. For future research, it would be useful to use a survey to get quantitative results to strengthen the conclusions in this research with statistical data.

Last, because it was not very useful to collect extra data from the region of Twente, it was chosen to take the Northern provinces as the focus region for the research. This also concludes another limitation of the research. The research is only conducted in the region of Groningen and the region of Twente. It could be argued that because of this relatively small focus area, the results are not as generalizable as supposed. It could be the case that the findings in other countries differ from the results that are found in the Netherlands. In addition, the Randstad is not considered in this research, it could be that the results, in this very industrious part of the Netherlands, are different. For future research, it could be interesting to explore regional differences between more regions, or to classify different regions in groups, to make the research a little more generalizable.

APPENDIX

APPENDIX 1: INTERVIEW SCRIPT

Script for Regional Entrepreneurial Actors and Regional Researchers	
Regional entrepreneurial actor (REA)	
1	Please, talk more about how it works the programs that stimulate the creation and development of KIE / startups / firms? (Incubation / acceleration or other innovation programs?)
2	What is the profile of a company that the program works with? Is it early-stage startups (modeling the business model, for example)? Or firms in a more mature level of development (already established the core business, operations, and commercialization)?
3	What do you think the firms expect to achieve after the program's participation?
4	Could you mention the benefits that the program offers for the firms that participate?
5	Which areas (commercial, technology, operations, or financial) do you think are most impacted in the companies that participate in the program?
6	Does the program support or stimulate the companies' investments in scientific research and technology change?
7	And about the training of employees or hiring of new ones?
8	Which are the mechanisms the program uses to follow up the companies' participation during your program? And after the finalization of it?
Dynamic Capabilities	
9	Do you support the process of acquiring new technology knowledge for the participants? Example: support the technological learning of the firm, like benchmarking or support the acquiring of new products for the production process.
10	Does the program help the companies to develop their business model? In which way?
11	And about the development of the technology/product? Does the program help the companies to improve it?
12	Does the program support the companies in the commercial process?
13	Does the program support or stimulate the companies to interact with other participants or externals to exchange knowledge?
14	Does the program help the firms with the purchasing process and the relationship with suppliers?
Valorisation process	
15	Does the program support the process of R&D in the companies? In which way?
16	How do you consider that the program helped the companies to change and develop their innovation capabilities?
17	Do you perceive a big difference between the product/technology of the companies at the end of the program comparing when they started?

18	In this sense, how does the program measure the results (in terms of innovation outputs for the companies) at the end of the program?
19	Could you mention some success stories of companies that passed through the program? And about the companies that couldn't succeed, what reasons do you think led to this?
Script for Knowledge-Intensive Firms and Entrepreneurs	
Innovation Program	
1	How is your participation in the innovation/entrepreneurship incentive program?
2	What was your initial intention to join the program?
3	Which areas of your company are impacted by the participation in this program?
4	Did this program allow you to contact and develop relationships with new partners (customers, suppliers, etc)?
5	Does the program/institution support the process of R&D in your company?
6	How has your company improved in aspects such as technological learning of the employees (absorbing new information, knowledge) or about hiring new ones?
Dynamic Capabilities	
7	Could you talk about how the program influences the development of the capabilities of your company? Example: improving the process of acquiring new knowledge; improving the commercialization process; among others.
8	How the participation in the program affects your product/technology? And the business model?
Absorptive Capability	
9	What do you think about the learning process of your organization? How the participation in the innovation program impact this?
10	Do you think your company assimilates other actors' knowledge to build new products and/or services during the program?
11	Do you design alternative prototypes for your company's products and/or services? Does the program influence it?
Network Capability	
12	Who are your main partners today? How did you build a relationship with them?
13	Do you think strategically about which partners you want to prospect? Does your experience in the innovation program help in any way with this selection of partners?
14	How does the innovation program impact your current partners (trading partner, supplier, or learning partner)? Investigate aspects like: Learning Process; Commercial Partnership; Others
15	How do you collaborate with other institutions/companies during the program?
	Innovation Capability
16	The program/institution supports or stimulates your R&D process?
17	Do you think the program/institution helps your company improve itse product/technology or create new ones?

18	Could you talk about how the program influences the development of the innovation capabilities of your company?
19	What are the problems and expectations of the customers that your innovations/products aim to solve? The program/institution helps you improve the value offer for your customers?
20	What is the impact of these innovations on your segment? How could you improve it during your participation in the program/institution?

APPENDIX 2: SYSTEM ELEMENTS INNOVATION ECOSYSTEM

Concept	Construct	Definition	Element
Institutions	Formal institutions	The rules of the game in society	Formal institutions
	Informal institutions	Cultural context	Culture
	Social networks	The social context of actors, especially the degree to which they are socially connected	Networks
Resources	Physical resources	The physical context of actors that enables them to meet other actors in physical proximity	Physical infrastructure
	Financial resources	The presence of financial means to invest in activities that do not yet deliver financial means	Finance
	Leadership	The availability of entrepreneurial leaders and mentors.	Leadership
	Human capital	The skills, knowledge, and experience possessed by individuals	Talent
	Knowledge	Investments in (scientific and technological) knowledge creation	Knowledge
	Means of consumption	The presence of financial means to purchase goods and services	Demand
	Producer services	The intermediate service inputs into proprietary functions	Intermediate services
New value creation	Productive entrepreneurship	Any entrepreneurial activity that contributes (in)directly to net output of the economy or to the capacity to produce additional output	Productive entrepreneurship

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