Navigating digital ecosystems: Strategies for small businesses facing Big Tech dominance

Author: Mart Schluter
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT,
In an era where Big Tech organisations dominate digital ecosystems, small and medium-sized businesses (SMEs) and start-ups have unique problems in navigating and growing up in these competitive contexts. To acquire a clear and thorough picture, qualitative interviews were performed with important stakeholders from various SMEs and start-ups, as well as specialists who provided their knowledge. These interviews gave firsthand information and insights on the problems and methods used by these smaller organisations. The results of these interviews brought to light the difficulties that SMEs and start-ups encounter, including scarce resources and restricted access to market prospects. Furthermore, the insights furnished significant tactics and resolutions for overcoming these problems and thriving in the digital environment. Research highlighted the importance of topics like, agility and adaptation, collaboration driven ecosystems, customer-driven innovation, strategic resource management, scalability and growth, digital transformation. These dimensions can help businesses to navigate and thrive in digital ecosystems. Lastly, this research gives a complete framework set up into four phases, each of which focuses upon specific dimensions that are crucial to success. By following these phases, businesses can set themselves up for success in digital ecosystems.

Graduation Committee members:
Dr. Igors Skute
Franziska Koefer, MSc

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1. INTRODUCTION

Traditional business connections are being revolutionized by digital technologies (Subramaniam et al., 2019). As a result, some businesses may feel that the channels, platforms, and tactics they have been using for years are wearing thin faster than before as a result of the shift in customer behaviour toward digitalization and the widespread use of the internet by people of all ages for everything from groceries to cars to doctor visits (Chung et al., 2020). In addition to changing consumer behaviour, this fast digitization has also changed the competitive environment and created digital ecosystems. This has resulted in an increase in interest in the concept of "ecosystems" as a novel approach to describe the competitive environment. (Jacobides et al., 2018). In order to disintermediate, compete with, and frequently replace the products offered by traditional rivals, the new digital businesses developed current main ecosystems by employing large scale platforms to manage user interfaces and control points like search, advertising, and messaging. These digital ecosystems have become essential for companies wishing to remain relevant in the competitive market in today's rapidly changing industry.

The development of digital ecosystems has occurred alongside the astonishing rise of Big Tech: companies such as Apple, Google, and Meta (Jacobides, 2022). The extensive digital networks of these Big Tech firms control a number of industries, including digital media and e-commerce. The Big Tech firms control these industries by having the leading role in development and innovation, which results in them determining the technological advancement of these industries. These companies have enormous market power because they can influence consumer behaviour and market structures by utilising their enormous resources, wide-ranging networks, and unmatched access to data. This for example could be seen in Google's dominance in the search market, where its dominant position in search is further strengthened by the massive data it collects, which advances its algorithms and draws more users, creating a self-reinforcing loop (Relihan, 2018).The Big Tech use their digital ecosystems and platforms to innovate and create value in the ecosystems. Companies such as Google, Amazon, and Microsoft, for example, offer platforms and tools that let smaller firms and developers innovate and access new markets (Dietz et al., 2020). The Big Tech firms do this in multiple ways: by offering entrepreneurial opportunities to smaller players in the market and by constantly investing in research and development to stay ahead of competitors (Teece, 2010). Additionally, they often acquire smaller companies to expand their reach and capabilities within the industry (Y. Li et al., 2022). Companies may use this to improve their market position and broaden their portfolios, which frequently results in more innovation and an edge over competitors.

Economically speaking, digital ecosystems are increasingly serving as the foundation for new products and services, making them the major source of income for Big Tech firms (Z. Li & Qi, 2022). Not only, are digital ecosystems serving as a foundation for new products and services, but they are also serving as a new way of addressing customer needs (Senyo et al., 2019). Since digital ecosystems provide an innovative way to use resources like technology and specialist services from several sectors to meet the demands of customers. This leaves other companies wanting to join in on the ecosystems. However, these Big Tech firms are dominating the market leaving upcoming SMEs and start-ups little room for scaling their businesses independently and competing with these giants. From a technological perspective the ecosystems are of high importance. As technology players are increasingly focusing on ecosystems in creating innovations (Chung et al., 2020). Thus, also showing that the ecosystems can create new innovations. In addition, these ecosystems also allow for greater collaboration and integration of various technologies, leading to more efficient and effective solutions (Jacobides, 2022). Overall, the emphasis on ecosystems in both economic and technological aspects highlight their growing significance in the business world. On a societal level, traditional customs and routines are being transformed as individuals spend more time online, especially through Big Tech platforms (Kayser et al., 2023). Therefore, changing the traditional ways.

The dominance of the Big Tech firms can offer some opportunities to smaller players; however, the dominance of these firms also brings along challenges for the smaller players. The smaller firms can become dependent of the big players and the barriers for innovative disruptions become larger (Michon & Hyppolite, 2018). This is because these Big Tech companies exploit their financial strength, network effects, and nearly monopolistic activities to make it harder and harder for new and inventive corporations to disrupt the market. Furthermore, relying too much on Big Tech platforms may raise issues with data sovereignty, platform lock-in, and restricted control over client interactions (Khanal et al., 2024). Moreover, Big Tech's competitive strategies, such as purchasing rising rivals to mitigate potential risks, might hinder innovation and limit market variety (Mazzucato et al., 2021). It is crucial for smaller players to maintain a level of independence and diversification to mitigate these challenges and ensure long-term success in the industry. This allows them to reduce dependence risks while still maintaining better control over their business operations and client interactions (Khanal et al., 2024).

The primary business challenge for smaller businesses is navigating digital ecosystems dominated by Big Tech companies. The big tech firms are gaining more and more control over the evolution of the sector as a result of their expanding acquisition of digital services. Smaller businesses have the opportunity to either follow these advances or attempt to overthrow the current technical regime, as a result of the few incumbents controlling the majority of the technology market. Navigating the ecosystems dominated by Big Tech requires an understanding of the regulatory and operational frameworks established by these organisations. Smaller businesses must use agility to respond rapidly to changes, find niche markets, and provide specialised goods that larger corporations may ignore (Autio et al., 2018). This strategy enables them to create a loyal client base despite the overwhelming influence of huge corporations. Competition from Big Tech corporations, which have huge assets and powerful data analytics skills, contributes to issues for smaller businesses. Smaller businesses may stand out in an unfair competitive landscape by emphasising unique value propositions, encouraging innovation, and developing strong customer connections (Barykin et al., 2020). Improving data analytics abilities enables smaller businesses to make more informed decisions and anticipate what customers want. Forming strategic alliances and cultivating a culture of constant learning can help them continue to stay competitive (Song, 2019).

1.1 Research objective and question

This thesis aims to better understand how smaller players in the ecosystems market, such as SMEs or start-ups, can compete with or join the Big Tech firms. More specifically, the objective is to propose strategies and insights for SMEs and start-ups. Such a framework will be developed by identifying additional success factors for smaller players, basing the information on existing literature on strategies of SMEs in the digital ecosystems' world and on interviews with specialists in the field. Thus, this research

aims to build on existing frameworks to enhance strategies for SMEs and start-ups in the ecosystems market and to try to foster a more competitive and diverse digital landscape. While also keeping in mind if a venture should join an ecosystem or try to disrupt the industry to potentially reap greater rewards.

In order to accomplish this objective, the following research question has been developed: How can SMEs and start-ups effectively navigate and scale their business in digital ecosystems amongst the dominance of Big Tech firms?

1.2 Academic and practical relevance

In the current literature, the focus mainly lies on understanding ecosystems, showing how the dynamics work, and what strategies could be used to perform in the market e.g. (Chung et al., 2020). However, these theories are mostly based on the big players in the market, the Big Tech firms. As literature suggests the incorporation of SMEs and start-ups is missing (Tukiainen et al., 2019). Therefore, there is a gap in the literature regarding how smaller businesses can navigate and thrive within digital ecosystems. Exploring the unique challenges and opportunities faced by SMEs and start-ups in this context could provide valuable insights for both academics and practitioners.

In the field, digital ecosystems are becoming more important. as the digital economy continues to grow. Understanding how smaller businesses can effectively participate in these ecosystems is crucial for their success and overall ecosystem development. Consequently, this paper can assist managers and entrepreneurs of smaller companies in growing their enterprises and navigating the space of digital ecosystems. By providing insights and strategies for leveraging digital ecosystems, this paper aims to empower smaller businesses to compete with larger corporations in the digital marketplace. With the right approach, smaller companies can establish their presence, collaborate with other players, and ultimately thrive in the digital economy.

2. THEORETICAL BACKGROUND

2.1 Digital ecosystems and platforms

There have been multiple definitions established for digital ecosystems and digital platform over the recent years. We have lined up some of these definitions to come to the definition that will be used in this research. For example, digital ecosystems can be seen as communities of living and non-living subjects interacting with each other, with characteristics similar to biological ecosystems (Barykin et al., 2020). They can be classified based on scale, functionality, evolution, and level of centralization. Digital ecosystems involve automated decision making without human involvement, using tools like artificial intelligence (Barykin et al., 2020). On the other hand, digital platforms are technical infrastructures that utilize an ecosystem of social actors to change industries (Hein et al., 2019). They co-create value through interactions between supply and demand, with complementors playing a key role in developing complementary products or services (Barykin et al., 2020; Hein et al., 2019).

However, in this research we will use the definition of digital ecosystems as dynamic multi-agent environments in which platforms, companies, individuals, digital services, technology, and other agnostic but interconnected species collaborate occasionally to accomplish both individual and shared objectives (Mihale-Wilson & Carl, 2024). This broader definition allows for a more inclusive understanding of the various actors and elements involved in digital ecosystems, highlighting the complexity and interdependence within these environments. By recognizing the diverse interactions and collaborations that take place, we can better appreciate the innovation and value creation that result from these dynamic relationships. We go into further detail about the structural distinctions between platform ecosystems and digital ecosystems to help you understand these topics better.

When discussing platform ecosystems, one or more connected platforms serve as the ecosystem's foundation. Nonetheless, the community revolves around the platform owner, and the platform itself is an essential component of the value generation process (Hein et al., 2019). This platform facilitates communication between different parties, frequently serving as an intermediate between suppliers and customers. According to Hein et al. (2019), the platform owner receives advantages from the transactions associated with their platform and has the authority to establish the rules of governance for all interactions between actors. When the platform ecosystem develops and grows, the platform owner maintains a fair amount of influence over its early stages.

Conversely, when considering a more comprehensive notion of the digital ecosystem, the fundamental components of the ecosystem comprise many species (such as digital tools, platforms, technologies, services, organisations, and consumers) that live in harmony and mutually benefit from each other (Jacobides et al., 2018). The community develops in modular units based on generating new possibilities or providing unique value, regardless of the platform or technology. According to Jacobides et al. (2018), modularity is the quality of an ecosystem in which cooperation and relationships among its members are not regulated by a single dominating or controlling body once it has developed. As an alternative, individuals function autonomously and engage with one another in digital ecosystems according to their own aims and purposes.

Digital ecosystems and platforms can be useful for start-ups and SMEs by providing them with the ability to connect people, organizations, and resources to facilitate core interactions between businesses and consumers, ensuring greater efficiency in business management (Ruggieri et al., 2018, Walton, 2022). These platforms create new business concepts based on innovation, scalability, and community relationships, allowing start-ups and SMEs to access international markets at a low cost and become successful in the digital economy. Digital ecosystems help start-ups and SMEs by providing them with access to specialized services and tools that facilitate resource acquisition, product development, and innovation processes (Barykin et al., 2020). Through the use of artificial intelligence and computer vision technology, digital ecosystems may make decisions automatically, which can result in more efficient operations. Within digital ecosystems, mutual aid and cooperation take the place of conventional rivalry, promoting development and giving businesses a competitive edge. We can consult the strategic management literature to better comprehend the strategic space in ecosystems and investigate the expectations and ambitions of enterprises considering entry into digital ecosystems.

2.2 Strategic management in ecosystems

Digital ecosystems, whether they are for production or consumption, are all connected by data. Product-generated data is channelled into various types of interdependencies by being exchanged and used both outside and within the value chain. Both provide fresh chances to change how a business engages with its clients, necessitating strategic planning. They do, however, provide businesses distinct strategic alternatives and mould a competitive strategy in diverse ways (Subramaniam, 2020). Due to new opportunities arising from data, the scope of competition also extends along with the scope of value. New competitive situations and dynamics result from the addition of

data-based rivalry to product-based competition in digital ecosystems (Subramaniam, 2020). These production ecosystems, in essence, reinforce a firm's existing competitive advantage by introducing digital connection into value chain interdependencies (Subramaniam, 2020). Then the company's competitive advantage may be greatly increased by digital ecosystems through the use of digital connections and data. SMEs and start-ups may create new services linked to product performance by utilizing product-generated data. This allows them to modify features based on user-generated data and offer measures for enhancement. Because it enables ongoing monitoring and improvement of product features catered to user demands, this capacity is critical for growing operations and enhancing customer satisfaction (Subramaniam, 2020).

The organisational strategic management literature also offers a framework for examining how businesses plan and make strategic choices, including whether or not to join a digital ecosystem. Businesses frequently join digital ecosystems in order to accomplish particular objectives, such as reaching a wider audience or using emerging technology to drive innovation. The organisational strategic management literature offers the knowledge and resources needed for identifying these objectives and show how they fit into the company's larger strategic plans. As said earlier, like other strategic corporate decisions, the decision to engage in digital ecosystems is based on the expected benefit from the ecosystem. However, evaluating the specific advantages of participating in the digital ecosystem is just as difficult as assessing the value and effect of IT in organisations. Examining the argument in more detail, the research now in publication suggests that investments in technology and information systems may produce both concrete and intangible benefits, some of which may not become apparent for some time (Mihale-Wilson & Carl, 2024). Adhering to a digital ecosystem bears similarities to IT investment decisions, such as the associated risks, the necessity for a sustained commitment, and the possibility of requiring alignment with the organization's overarching strategic objectives. The decision to enter a digital ecosystem may also have physical and intangible effects, comparable to IT investment decisions. These consequences may not be immediately apparent and may take years to materialise, making their upfront quantification particularly difficult.

Recent studies suggest that key performance indicators (KPIs) should be developed in strategic management to ensure the success of business ecosystems. As industries digitize and industry borders fade, businesses need robust systems for measuring and managing their contributions to these complex networks. KPIs provide this framework, allowing businesses to align their efforts with ecosystem goals and achieve shared success (Jacobides, 2022). KPIs provide a standardized framework for measuring the success of strategic activities in an ecosystem. They assist enterprises in aligning their particular aims with those of the ecosystem, promoting coherence and cooperation among varied actors. This alignment is critical for avoiding operational disparities and ensuring that all ecosystem members work towards common goals, which are required for collective success (Adner, 2016; Jacobides, 2022).

Furthermore, KPIs promote informed decision-making by providing actionable information into numerous elements of ecosystem performance. They enable firms to track customer interaction, innovation rates, and digital technology integration, offering a complete view of the ecosystem's health and progress (Autio et al., 2018). These insights enable businesses to recognise strengths and weaknesses, modify plans in real time, and allocate resources more effectively, giving them a substantial advantage in today's unpredictable digital landscape (Jacobides, 2022). KPIs play an important role in maintaining interactions with ecosystem partners. Firms can develop clear performance criteria to define collaborative expectations and benchmarks. This transparency develops trust and responsibility, both of which are essential for long-term relationship success. Furthermore, KPIs enable performance comparisons across several partners, assisting in identifying and supporting strong performers while resolving concerns with underperformers, hence preserving a competitive and innovative environment (Adner, 2016; Jacobides et al., 2018). Furthermore, KPIs are critical for providing value to investors, consumers, and regulators. Given the complexities of ecosystems, it can be difficult to explain the overall value created. KPIs give tangible proof of performance and growth, allowing for better communication of the advantages of ecosystem engagement. This transparency can boost stakeholder trust and support, which is critical for retaining investment and involvement (Jacobides et al., 2018).

Finally, constant creation and refining of KPIs help to continuously strengthen the ecosystem. Firms acquire greater insights into ecosystem dynamics by studying KPI data, which allows them to revise plans and increase operational efficiencies (Jacobides, 2022). This continuous growth of KPIs enables businesses to keep ahead of market trends and ensure long-term success within the ecosystem (Autio et al., 2018). This implies that by efficiently employing KPIs, businesses can navigate ecosystem challenges, promote long-term growth, and meet their strategic goals. Since strategy can be seen as the basis of dynamic capabilities, in order to gain a deeper understanding of this idea, we will review the literature on dynamic capabilities.

2.3 Capability perspective on digital transformation

The concept of dynamic capabilities will be utilized to better understand how entrepreneurs in SMEs and start-ups may address the strategic problems they face in digital ecosystems. Dynamic capabilities are the ability of a business to: (a) identify and shape opportunities and threats; (b) seize opportunities; and (c) maintain competitiveness through the augmentation, combination, protection, and, when necessary, reconfiguration of the business's tangible and intangible assets (Warner & Wäger, 2019). Innovation is the foundation of dynamic capabilities, which set them apart from an organization's operational skills. The following is what the writers of Warner and Wäger (2019) claim that in order to confront impending or current circumstances, potential business models (present or short-term) are constrained by the dynamic capacities (medium-term) that strategy (long-term) puts up. Developing dynamic skills that can adapt to changing circumstances through the organization's business model is hence the essence of strategy. The dynamic capacities of the corporation then serve as boundaries for business models. This shows a connection between business models, strategy, and dynamic capabilities.

In the literature, multiple levels of dynamic capabilities can be found, two of these are the managerial capabilities and the organizational capabilities. These two being the most relevant as the research mainly focuses on SME managers and entrepreneurs. The idea of dynamic managerial capacities (DMC) offers a valuable theoretical lens through which to understand digital transformation in SMEs. DMC refers to the capacities with which managers create, integrate, and reconfigure organisational resources and competencies (Li et al., 2017). For this research, the DMC's emphasis on managers' capabilities is particularly compelling as, in the end, SME entrepreneurs are the ones driving their organisations' digital transformation, to join digital ecosystems and their capabilities are what make them

successful. According to earlier studies, management cognition, managerial social capital, and managerial human capital serve as the three main pillars on which DMC is based (Helfat & Martin, 2014). Human capital encompasses the skills and knowledge individuals gain through experience, training, and education. Recent studies have broadened this concept to include not just knowledge and skills, but also psychological traits like cognitive ability (general intelligence) and other attributes such as personality, values, and interests, collectively known as "KSAOs" (knowledge, skills, abilities, and other attributes) (Helfat & Martin, 2014). Managerial cognition involves mental models and beliefs (knowledge structures), mental processes (cognitive abilities), and emotions. Given the vast and varied information managers encounter, they rely on knowledge structures to navigate their informational environment. These structures influence managers' biases and heuristics when forecasting market trends, assessing the consequences of different decisions, and taking action (Helfat & Martin, 2014). Managerial social capital refers to the goodwill generated from formal and informal interactions, which can be leveraged to acquire resources and information. Such relationships provide managers with valuable information channels for identifying new opportunities (Helfat & Martin, 2014). Therefore, enhanced Dynamic Managerial Capabilities (DMC) lead to improved corporate performance by enabling effective strategic changes, such as digital transformations in our study context (Li et al., 2017).

The other level of dynamic capabilities are organizational capabilities. Organisational capability is the ability of an organisation to carry out a certain task in a consistent, at the very least, acceptable way. The general notion of organisational skills encompasses a range of more particular capabilities that are relevant to various organisations in various contexts (Li et al., 2017). Organisations must often develop new competences in order to compete in new markets or engage in new commercial ventures following an organisational change. For effective digital changes, businesses must develop new organisational capacities in order to thrive (Li et al., 2017). For the sake of this study, Warner and Wäger's (2019) research is referred to, which makes the case that digital dynamic capabilities are the actions of digital sensing, capture, and transformation that help to further the objectives of digital transformation. It is predicated on businesses implementing digital technology. Companies can accomplish unique and radical innovation through self-adaptation and self-adjustment based on dynamic capacities. The notions from Li et al. (2017) should also be kept in mind when determining the organisational and managerial capabilities of SME managers. By combining insights from both Warner and Wäger (2019) and Li et al. (2017), businesses can develop a comprehensive understanding of how digital dynamic capabilities can drive successful digital transformation in SMEs.

In order to attain success in digital ecosystems, a dynamic capability perspective is essential. As firms must constantly monitor changes in the ecosystem, such as developing technology, variations in client preferences, and strategic actions. This necessitates strong sensing skills, which are an essential component of the dynamic capabilities' architecture (Teece, 2018). The capacity to properly identify and comprehend these changes enables businesses to keep ahead of trends and possible disruptions, enabling them to respond proactively rather than reactively adapt. Seizing opportunities in the digital environment requires not just finding them, but also mobilising the assets and abilities required to capitalise on them. This involves using digital technology, encouraging innovation, and working with ecosystem partners (Warner & Wäger, 2019). Dynamic capabilities allow businesses to adjust their resource base, keeping them nimble and responsive to changes. Firms may quickly pivot to capitalise on new possibilities by efficiently reallocating resources and optimising processes, therefore strengthening their market position and generating growth.

Furthermore, the capacity to modify and reconfigure organisational resources is critical for sustainable growth in digital ecosystems. To stay in line with the ever-changing external environment, businesses must constantly adapt their business models, procedures, and strategies. This transformational characteristic of dynamic capacities promotes continuing innovation and adaptation, ensuring that enterprises maintain a competitive edge (Karimi and Walter, 2015). Firms can prevent decline, stay relevant in their markets, and keep their offerings competitive and desired by transforming on a regular basis. Continuously detecting environmental changes and leveraging on new possibilities directly contribute to a company's performance by encouraging innovation and flexibility (Teece, 2018). Firms with high dynamic capabilities are better positioned to anticipate and adapt to market demands, boosting consumer satisfaction and loyalty (Warner & Wäger, 2019). Furthermore, these companies are more likely to outperform competitors by swiftly adapting to new technologies and business models, ensuring that they do not fall behind in a continuously changing digital market (Karimi & Walter, 2015). Dynamic capabilities also encourage successful cooperation within the digital ecosystem. As firms may increase their innovation potential by collaborating with partners, consumers, and other stakeholders (Warner & Wäger, 2019). This collaborative strategy not only increases the firm's position in the ecosystem, but it also promotes collective growth and development, which benefits all stakeholders (Teece, 2018). In order to fully understand the strategies, techniques, and dynamic capabilities employed by SMEs and start-ups in digital ecosystems, further research is necessary.

3. METHODOLOGY

3.1 Research context

Continuous innovation and digital transformation are the driving forces behind the ongoing evolution and diversification of digital ecosystems. Businesses can create new value propositions and business strategies with the help of these ecosystems. But the hegemony of Big Tech firms like Amazon, Google, Facebook, and Apple poses serious problems for smaller businesses, especially start-ups and SMEs. These problems include fierce rivalry and obstacles to market entry (Nambisan et al., 2019).

The growing digital transformation in many sectors of the economy emphasizes how important it is to comprehend how SMEs and start-ups may successfully navigate and develop in these changing ecosystems. This shift is centred on the growth of digital products and ecosystems, which present both new opportunities and special challenges (Yoo et al., 2012). Due to their limited resources and lack of market strength, SMEs and start-ups frequently find it difficult to compete with larger, established enterprises, despite the crucial role they play in promoting innovation and accelerating economic growth (Autio et al., 2018).

This study examines the strategies used by SMEs and start-ups to thrive in this highly competitive sector with an emphasis on the digital economy. Since the digital economy is a key factor in both global economic growth and innovation, it is very crucial for research purposes. Promoting a more diverse and competitive market requires an understanding of the tactics used by smaller businesses to overcome challenges and take advantage of digital transformation (Vial, 2019). To examine

these forces, this study uses detailed interviews to look at the major variables affecting how SMEs and start-ups navigate and scale inside digital ecosystems. Interviews enable the generation of firsthand insights from obvious patterns in the data and offer a detailed understanding of participants' experiences and methodologies (Thomas, 2006). This methodology provides a practical means of approximating the complexities of functioning within digital ecosystems and helps in the identification of effective tactics to enable smaller enterprises to succeed.

This project aims to improve our understanding of digital ecosystems and offer practical insights that can help small businesses thrive responsibly by concentrating on the strategies of SMEs and start-ups. The research will add to the increasing amount of knowledge on ecosystem development and digital transformation by emphasizing the significance of building a competitive and fair digital economy.

3.2 Sampling

For the interviews, a sample of 7 interviewees and companies has been established. It was thought that in order to better understand the strategies of businesses operating in digital ecosystems and the factors influencing such strategies, companies themselves would be the best source of information for this research. Therefore, a purposive sample was selected from the population, which focuses on a particular group with particular characteristics that can be targeted and who will be more able to assist with the pertinent research, as Etikan et al. (2016) emphasises. The sample selected was guaranteed to be representative of the population made up of companies active in the digital ecosystems sector by using a purposive sampling. Purposive sampling does have one drawback, though: it may reduce the findings' applicability to other groups.

To get expert and valued information, a purposeful sample of both homogenous and expert members of the population was selected. When conducting research, homogenous purposive sampling seeks to assemble a sample of participants with similar attributes, whereas expert purposive sampling is helpful in situations where observational evidence is currently lacking and knowledge from individuals with a specific area of expertise is needed (Etikan et al., 2016). Both sample techniques were combined since the goal of the interviews was to get expert information about the factors at work from a particular group. Some criteria were developed in order to guarantee that the interviewees were in fact topic experts. The first criterium being that the participant is either planning or already active in digital ecosystems. The second criterium is that the participant has been engaged in the field of digital ecosystems and digital transformation and have expertise in these fields. The final criterium is that the participant should have significant knowledge of strategy regarding navigating in digital transformation and ecosystems. Thus, the participants of the interviews were selected based on their experience and knowledge in digital ecosystems, ensuring a diverse range of perspectives.

3.3 Data collection

In order to collect data and identify strategies for smaller firms to navigate themselves among the big digital ecosystems, this research used a qualitative method. As various academics have advised using methodological triangulation to get a full grasp of the subject (Carter et al., 2014; Fusch et al., 2018). Bekhet and Zauszniewski (2012) describe this strategy, in which several data gathering methods are used to investigate the same topic. Methodological triangulation improves study reliability and validity by attempting to reconcile and corroborate findings from several viewpoints. In this study, main data were gathered through direct interviews, while secondary data were gained from blog posts or articles written by the interviewed firms that could be found online. In particular, interviews were used to gather primary data, while documents written by the firms that conducted the interviews provided secondary data. These interviews were conducted to gain first-hand expertise from professionals. These methods have been adopted because they provide a thorough investigation and comprehension of people's knowledge and experiences (Busetto et al., 2020). Experts on the subjects can exchange in-depth knowledge and insightful perspectives during these interviews. This interactive method allows for the emergence of unexpected subjects during the conversation and helps overcome biases present in written questionnaires (Bogner et al., 2009).

To acquire valuable data from specialists in the industry from the interviews, an interview guide was created with particular questions for the various topics to guarantee all relevant issues were addressed. The interview guide can be seen in appendix A. The various topics consisted of the following topics: digital ecosystems, strategies to navigate firms in digital ecosystems, digital transformation, and digital platforms. Understanding these topics enables SMEs and start-ups in strategizing through competitive environments, recognizing unique value propositions, and utilizing cooperative and innovative tactics for advancement in digital ecosystems. The questions that were asked in the interviews were based on existing findings and theory from previous studies. The questions were also asked in the about the same sequence to ensure about the same type of responses from the interviewees. This sequence of questions can have some deviations as a semi-structured interview approach has been taken which has allowed for follow-up questions during the specific sequence of questions to go more into depth on certain topics or certain answers from interviewees. Some of these follow-up questions were prepared beforehand to get about the same type of responses from the participants. Ensuring that the data being gathered from the interviewees are all in the same direction.

Expert information on the driving reasons behind the businesses' strategy in digital ecosystems was gathered through the interviews. Since the participants had first-hand knowledge and expertise with the subject, the data may be regarded as trustworthy because it was gathered directly from businesses in the digital ecosystems sector. The validity of this first-hand information, however, might also be called into doubt since participants might have provided responses that advance their own interests or are socially acceptable. To try to limit this from happening, usage of follow-up questions has been used to explore more truthful and accurate data. By probing deeper with follow-up questions, researchers can uncover any potential biases or hidden agendas that may have influenced the initial responses. This approach helps to ensure that the data collected is as objective and reliable as possible, despite the inherent limitations of self-reported information.

3.4 Data analysis

The interviews have been recorded and transcribed to make sure that every response was accurately documented. The data from the transcribed interviews were then analysed using the Gioia approach (Gioia et al., 2012). This was the following stage. This approach will help present the findings in a convincing and engaging manner while showcasing the richness of the data and rigor of the analysis (Magnani & Gioia, 2023). The Gioia technique is a methodical process that produces reliable data interpretations. First Order Concepts, Second Order Themes, and Aggregate Dimensions are the final ways that the interview statements are combined. The most informant words are identified in the first-order analysis. The themes that surface

from the first-order analysis are examined in the second order analysis, along with whether or not these themes offer notions that might aid in describing and explaining the observations that were made. Following the differentiation of themes and ideas, these themes are then further reduced into combined dimensions (Gioia et al., 2012). These combined dimensions allowed for the identification of the main insights and finding related to the dynamics and strategies in the digital ecosystems industry. Overall, this multi-step analysis process provides a comprehensive understanding of the data collected and helps in drawing meaningful conclusions. By breaking down the themes into combined dimensions, the researchers can gain deeper insights into the complexities of the digital ecosystems industry.

4. RESULTS

This part investigates and presents the first-order concepts and second-order themes discovered through qualitative data analysis of semi-structured interviews, which are organised and arranged into third-order aggregate dimensions. A visual overview of the data structure can be found in appendix B. All respondents are referred to as R following with the corresponding number. Such as R1 or R4.

4.1 Agility and adaptation

In today's fast changing digital economy, SMEs and start-ups must prioritise agility and adaptability in order to effectively manage and expand their operations. Agility enables an organisation to adjust quickly to market changes and technical improvements, which is critical for navigating digital ecosystems.

The ability to be flexible is very important in ecosystems in order to keep on innovating and competing within the digital ecosystems. This is why **an agile organizational structure** should be implemented in smaller companies. As smaller businesses are more agile because of their underlying adaptability and pace of implementation. This is because smaller firms can more quickly than larger firms make use of new technological advancements into their operations thus giving them a slight advantage to their competitors. This agile organizational structure also allows firms to pivot and transform enables smaller firms to remain relevant in the digital landscape which is continuously evolving. Such agile organizational structure can be supported by lean management structure which help organizations to make decisions quickly and swiftly implement new ideas and processes. Having the ability to swiftly learn from errors and victories enables these organisations to adjust their strategy and operations in a timely way. For example, implementing agile approaches in project management can improve the ability to adapt to changes and absorb new ideas quickly.

Adaptive market strategies are another critical aspect of agility and adaptation. As this show the ability of companies to adjust to the changing market conditions and come up with new or adjusted strategies to respond to the changing market conditions. These strategies are focused on the company's ability to keep up with market changes and changing customer preferences. This ability to adapt enables that companies can take advantage opportunities and minimise potential threats quickly. By consistently refining their market strategies firms can sustain their competitive advantage and keep on growing their firms. Furthermore, adaptable market strategies frequently need that businesses invest in data analytics skills. Companies may acquire significant insights into their strategies by analysing market data, consumer feedback, and competition intelligence. This data-driven strategy allows them to recognise trends, predict demand, and tailor their marketing and sales strategies appropriately. Advanced analytics tools and approaches, like predictive analytics and machine learning, can help them anticipate and respond to market developments more effectively.

Environmental scanning and market sensing are vital for SMEs and start-ups working in digital ecosystems. The environmental scanning is the collection and analysis of the external factors that have influence on the organization. By taking advantage of market sensing, smaller firms can find early signs of change and implement their business strategies accordingly. This active approach helps smaller firms to stay agile and ensure that they can take advantage of new opportunities and find their way through uncertainties. This also helps organizations to make better informed decisions in their strategies. This is emphasized by R1 stating: *"In the early phase, when they're still working on problem-solution fit, they should mostly focus on their network and the outcomes of the conversations that they have with potential customers. Because the market can change".*

4.2 Scalability and growth

Scalability and growth are critical to the long-term success of SMEs and start-ups in digital ecosystems.

The ability to scale is first on the list for this dimension. As the ability to scale an organization efficiently when demand is increasing is essential for companies to keep on growing. This ability to scale goes hand in hand with scalable business models. These business models foster flexible structures that can also easily be adapted. The business models due to its flexibility should be able to handle an increasing amount of demand and complexity while not lacking behind on performance. Smaller firms that give priority to the scalability of their business can achieve cost efficiencies when demand is increasing which in turn can lead to bigger their competitive advantage. Scalable businesses also should leverage digital technologies as ways to streamline or even automate processes which can also result to an enhanced level of productivity and less obstacles in the business process. Furthermore, companies can experiment with scalable business models platform-based models, and digital products. These models may produce recurring revenue streams and are easily scaled as consumer demand increases.

Next, the **implementation of growth opportunities** also helps organization in achieving their business goals and market presence. These opportunities can come in the form of the introduction of new products, digital transformation or using AI and analytics. Smaller firms that continuously adapt to the changing market dynamics and strategically approach growth can identify and seize new opportunities in the market which in turn can lead to business success. Strategies that may be implemented to capitalize on growth opportunities can be a continuous market analysis and benchmarking against the competition to make well informed and strategic decisions. By understanding and acting on the changing market, smaller firms can identify new growth opportunities and act on them to drive their revenues and market presence. According to a R2, *"The Netherlands is currently becoming a less and less attractive place to establish yourself as a company, so the question is certainly for companies that have passed the start-up level that are starting to scale up ask themselves am I going to do that here or am I going to do it somewhere else".* This emphasises the significance of strategic decisions on location and market targeting as part of growth opportunities. Furthermore, growth initiatives should be backed up by strong marketing and sales activities. Businesses may use digital marketing platforms to attract new consumers, increase brand recognition, and create leads. Companies that use a multi-channel marketing strategy

may efficiently target multiple client categories while also expanding their market reach.

4.3 Digital transformation

An effective digital transformation is a cornerstone in the process of navigating digital ecosystems.

Making sure that the technology that is being used in the digital ecosystems space align with the overall goals of the company as this is a vital part of successfully **utilizing technologies** to gain a competitive advantage. Most important is the integration of the technology into business operations in a way that it is supporting of strategical objectives. Smaller firms should make the utilization of technology a priority as this can help them enhance their capacity to innovate and create more efficient operational processes. This ensures that firms are able to transform their processes in order to keep hold of the everchanging market dynamics. By ensuring the technology that is available is being used, companies can be more agile and enhance their abilities to adapt to market changes. To improve their environmental scanning skills, smaller firms can use a range of digital technologies and platforms. For example, social media monitoring systems can give real-time insights into customer sentiment and new trends. Furthermore, industry papers, market research studies, and competitive intelligence tools can provide significant insights into market dynamics and competitor behaviours.

The adaptation of new technologies is also of high importance in digital ecosystems as new technologies can drive innovation, efficiency and even customer engagement. The adoption of these new technologies thus can enhance a company's overall business performance. These new technologies should be mainly focused on the streamlining of business processes and on enhancing customer experience. By leveraging technological adaptation smaller firms can not only foster innovation and create more value for their customers. They can also enhance their operational process and improve their decision-making processes in order to deliver even better products or services. In the interviews, R1 emphasised the quick speed of technological progress, stating, *"The biggest challenge is that the technology is going so fast that you can implement a new tool almost monthly. Because there's always one that improves or has some features that are a bit better than the others with implementing such a tool in your way of working it takes a lot of time, energy, and effort"*. This demonstrates the dynamic nature of technology adaptation and the importance of strategic management in keeping up with rapid technological changes.

4.4 Collaboration driven ecosystems

Creating ecosystems where collaboration stands at the forefront is an essential part of navigating and scaling in ecosystems. This is because collaborative ecosystems foster innovation and can ensure sustainable growth for companies.

The **integration of ecosystems** is fundamental in collaborative ecosystems. As SMEs and start-ups can benefit massively form forming partnerships with other firms and bringing them together in ecosystems. These ecosystems allow for the sharing of knowledge, expertise and resources between the participating firms. This can lead to the development of innovative solutions and better market positioning. By collaborating businesses can access new customer bases, new technologies or even new markets that would otherwise be a challenge to reach. The synergy in these ecosystems should foster innovativeness and a will to continuously improve which are of high importance in digital ecosystems.

Leveraging partnerships within these ecosystems is a crucial part of scaling in digital ecosystems. This is mainly because these strategic partnerships can enable innovation and expand a company's market reach by leveraging the abilities and strengths of both companies. Also, by leveraging partnerships with larger firms, the smaller firms can better their competitive positioning and accelerate how fast they grow. The partnerships can provide chances of the sharing of knowledge and the building of capacities. Additionally, strategic partnerships can assist businesses overcome some of the hurdles to market entry and expansion. Smaller businesses can get access to greater distribution networks, established client bases, and important industry insights by collaborating with larger companies. These relationships may also help organisations gain credibility and improve their reputation, making it simpler to recruit consumers, investors, and other stakeholders. Both are essential in the process of sustaining being competitive in the long run. The importance of the partnerships is emphasized by the following statement by R1: *"We have a multiple partnership on a national level. So, with all kinds of other incubators. We have a partnership with the university and the novelty of Munster. So, then that's how we already have an international network and communities available."*. Additionally, it was also found that organisations scale more quickly when they solve difficulties together and exchange information under the supervision of experts and experienced practitioners (Techleap, 2024).

Another crucial aspect of collaborative ecosystems is the use of **collaboration and networking** within the ecosystems. This is another vital step in making sure the operations in the company are enhancing but it also encourages innovation. As also shown by this statement stating that a digital ecosystem is worthless without partners, even if you have created an excellent ecosystem platform (Fraunhofer IESE, n.d.). The interorganizational collaboration is known as the process of sharing knowledge, ideas, best practices and resources among the collaboration group. This approach can lead to an open culture wherein mutual learning is of high importance. This culture can lead to developing new innovations and an improved in organizational performance. Smaller firms should use collaboration and networking in order the enable for the collective expertise their partners offer which can help them in their decision making and problem-solving process. The trust between these companies also allows for strong relationships in the ecosystems resulting in strategic advantages in the long term. Furthermore, ecosystems networks can give businesses access to new technologies and capabilities that they may not have internally. Partnerships with technology companies, for example, may help businesses incorporate innovative digital technologies into their operations. These agreements can also help to co-develop new goods and services by using each partner's complimentary skills.

4.5 Customer-driven innovation

By focusing on innovation driven by the customers, smaller firms can stay competitive by aligning their business offering to the expectations and needs of their customer base.

Having **market intelligence** is another crucial aspect for success in digital ecosystems. This encompasses a firm's ability to monitor the conditions in the market and adjust their strategies accordingly. Firms that can do this well can make strategic decisions more quickly and more effectively, making sure that they remain relevant and competitive in the market. To gain this market intelligence, firms should make sure they leverage data analytics and market monitoring tools. By continuously monitoring and analysing firms can anticipate shifts in demand and actively address upcoming problems and opportunities.

Next, smaller firms should focus on **feedback driven improvement,** which could also by seen as a way market sensing. This encompasses that firms should actively seek and integrate the feedback they get from their customers. While also using this feedback to develop new services or products that are tailored to the needs and expectation of their target audience. This approach allows firms to engage with their customers and use this feedback to create products that resonate with their customer base and address the problems they have. It also focuses on the functionality, usability and overall look of the service or product which are crucial for firms to have high customer satisfaction and a loyal customer base. By using digital tools in this process, the firms can collect data and focus on the user experiences, which can differentiate these firms from their competitors. Firms can also adopt systematic systems for collecting and analysing client feedback. This may entail establishing formal feedback loops, such as frequent consumer surveys, focus groups, and user testing sessions. Firms may find trends, preferences, and pain points that guide product development and improvement by collecting and analysing feedback in a systematic manner. Feedback is of high importance as R1 noted that: *"It still all comes down from feedback from the current customers and if they can get it working. I think that's the most important, so they need to use the tools to their benefit in order to filter the right information but always keep the personal touch with their first customer base."*.

4.6 Strategic resource management

Strategic resource management is critical to optimising operations and meeting strategic objectives.

Effective resource management is crucial in the process of strategic resource management. This involves efficiently using resources, which are human, financial and technological. This is essential in order to maximize productivity and minimize waste in operational processes. Firms should use their resources in a way that it maximizes their value and their contributions to the business. Optimizing the resource management can help in reducing operational costs and enhance their operational processes. Which in turn can lead to competitive advantages. Additionally, SMEs may use lean management principles to improve processes and remove waste. Lean management aims to maximise value while minimising waste, ensuring that resources are utilised efficiently and effectively.

Using digital tools strategically is another crucial aspect to thrive in digital ecosystems. Strategically using these digital tools firms can keep up with the increasing complexity that comes with business growth, while also being able to efficiently be managing their business processes. By efficiently using digital tools and by making sure these tools are strategically aligned with a firm's organizational goals, firms can be able to use tools that can facilitate their growth journey and optimizing their businesses process. This can lead to firms growing in digital ecosystems and allowing to achieve sustainable success. R1 mentioned, *"it takes really a lot of time, energy and effort to streamline it so that's in my opinion the biggest challenges other are always opportunities for new tools, but it goes in such a pace that it's almost impossible to keep up with implementing it in your company making sure that you fully utilize it."*. This emphasises the significance of selecting and implementing technologies strategically in order to efficiently optimise the use of resources. Furthermore, businesses should undertake frequent technology audits to determine the efficacy and relevance of their current technology stack. This entails assessing the performance, scalability, and suitability of current technology for business operations. Companies may make more informed technology upgrades and replacement decisions by identifying gaps and opportunities for improvement. Also, by incorporating key stakeholders in the technology planning process ensures that technology expenditures are aligned with the objectives and goals of various departments within the organisation.

5. DISCUSSION

In managing and developing their businesses inside digital ecosystems dominated by major technology companies, SMEs and start-ups can benefit from many important tactics emerging from the interaction of digital ecosystems, strategic management, and dynamic capability theories. By conducting interviews, this research has created a roadmap for SMEs and start-ups to effectively scale and navigate their businesses in digital ecosystems. This roadmap consists of four phases that should be followed in the given order, but each phase should be consistently improved on and has to be scanned in order to find more or other or better opportunities.

Phase one "Building", in this phase the focus lies on creating a strong basis for businesses to navigate in digital ecosystems. Within this phase the emphasis lies managing resources strategically and collaborative ecosystems. The first aim in this phase is to create networks and strategic partnerships. This can be done with other businesses, universities or research institutions. These collaborations could also be digital which means the collaborations could be more global and widespread. This is a means to gain more knowledge and allows for firms to leverage shared resources, which can assist in fostering an innovation and support culture in the ecosystem (Adner, 2016). Next, the firms should collaborate with each other and integrate themselves in a fitting ecosystem in order to create an effective ecosystem. By using the relationships inside the ecosystems, firms can create a strong network of firms that allow for a mutual support in attaining growth. Growth opportunities can be certain advantages, such as entry into new markets, access to new technologies or gaining expertise in specific sectors (Jacobides et al., 2018). The make sure firms create the ecosystems as efficient as possible it is important that they use their resources strategically. Firms should optimize their resource usage allowing for maximum productivity and minimal waste. This can involve techniques like, the leveraging of digital tools or the adoption of lean management practices. Effectively managing resources is not only an internal practice but firms should also strategically use the resources at hand in the ecosystem. This includes all the types of resources, like human capital, financial resources and technological assets (L. Li et al., 2017). All resources should be used where they are most needed. Clear planning and strategic plans can be highly effective in ensuring resources are used in the best possible way. Already looking ahead, it is also important that processes within the firm should be set up in a way that allow for support of operations as the business grows.

Phase two "Adaptation", during this phase agility and adaptation become crucial. A firm's ability to be flexible, responsive to the changing market conditions, and adaptive to technological advancements becomes essential in this phase. It is important to have the ability to be agile in integrating and adjusting to novel technology, and to modifying tactics in reaction to input from the market. Businesses should always be keeping an eye on consumer demands and market changes and modifying their strategies as necessary (Nambisan et al., 2019). Fast replication and reactivity are features of this phase, which guarantees that businesses stay relevant and competitive (Subramaniam, 2020). It is important to have an organisational culture that facilitates swift decision-making and flexibility.

Firms are able to successfully manage uncertainty and take advantage of new possibilities because to their agility.

Phase three "Growth", the focus of the businesses should shift towards scalability and growth. The goal should be to streamline business operations and leverage resources to support growth and scalability. Therefore, companies should concentrate on growing their operations to accommodate the rising demand. To achieve this, scalable business models that support expansion without sacrificing effectiveness or quality must be created (Teece, 2010). Business models that are scalable are made to manage different demand levels and operational complexity. Prioritising scalability allows businesses to take advantage of economies of scale and save costs, both of which strengthen their competitive edge. To increase efficiency and automate procedures, this calls for the development of adaptable structures and the use of digital technology. It is essential to put strong growth plans into practice, such as diversification, regional development, and the launch of new products (Chung et al., 2020). Businesses need to constantly assess market trends and measure themselves against rivals in order to make strategic choices that will increase revenue. Firms must also modify their KPIs to their expanding business in order to provide them with fresh targets to work on and further build their business.

Lastly, in **phase four "Transformation"**, businesses should focus on customer-driven innovation and digital transformation. To drive long term success and maintain a competitive edge, firms should meet customer expectations and demands. Thus, it becomes critical at this point to recognise and incorporate client demands into the innovation process. Firms should set up systems for social media, surveys, and in-person encounters to gather and analyse client feedback (Yoo et al., 2012). In order to create new items that satisfy consumer demand, this data should be utilised to improve current ones. Customers are more satisfied and loyal when they are involved in the product development process since it guarantees that the solutions offered are user centric. It also entails making use of digital technology to spur innovation and open up fresh commercial prospects. To improve goods and services, this may include implementing cutting-edge technology like artificial intelligence, machine learning, and the Internet of Things (Pappas et al., 2018). Again, KPIs are critical because they must adapt to the changing company environment as it transforms digitally and responds to client needs. As a result, it is critical to constantly evaluate KPIs and adjust them as needed.

Additionally, companies want to investigate novel income sources and business models, such platform-based business models, digital marketplaces, and subscription-based services. Adopting digital transformation may also increase operational effectiveness through cost savings, process automation, and better decision-making. In order to improve their capacity to make well-informed strategic decisions, businesses should invest in digital tools and platforms that provide real-time data collecting and analysis.

After every phase it is essential for businesses to always look back at the phases beforehand to ensure that the processes in place are still effective for the situation at hand otherwise it is of high importance to come back to the phases show opportunity for improvement.

5.1 Theoretical implications

This study's findings highlight the necessity of understanding the complex dynamics that exist inside digital ecosystems. Digital ecosystems, which are linked networks of organisations, people, and digital technology, enable interactions and collaborations that generate and share value. This research focuses on how SMEs and start-ups may use digital technologies and strategic alliances to improve their competitive position within these ecosystems. Digital platforms and ecosystems are the dominating organisational structures in the digital age, allowing businesses to grow their operations and innovate more effectively (Gawer, 2021). This study supports the idea that SMEs and start-ups must actively participate in these ecosystems to reap the benefits of shared resources and collective wisdom. Aulkemeier et al. (2019) build on the notion of digital ecosystems, highlighting platform-based cooperation as a vital component. Their research reveals that cooperation via digital platforms allows businesses to have access to a broader range of competencies and resources, which may be especially beneficial for SMEs and start-ups with limited internal resources. This is consistent with the study's findings, which highlight the importance of strategic networking and partnerships for gaining access to critical resources, mentoring, and market insights.

Furthermore, by cultivating a culture of continuous learning and innovation, SMEs and start-ups may gain the agility and flexibility required to survive in changing situations. This includes assessing and upgrading business procedures on a regular basis, adopting new technology, and remaining current with industry trends. The study's findings indicate that SMEs and start-ups should prioritise the development of dynamic skills in order to remain competitive in digital ecosystems. This theoretical contribution emphasises the need of dynamic capacities for maintaining competitiveness and attaining long-term success. As a result, Warner and Wäger (2019) and Helfat and Martin (2014)'s study on dynamic capabilities is supported.

To conclude, this study also adds to the strategic management literature by showing how SMEs and start-ups may traverse complicated and competitive digital environments using strategic planning and resource allocation. The findings emphasise the value of strategic networking, adaptability, and continual learning in gaining a competitive edge. These strategic management approaches are critical for SMEs and start-ups that want to compete in digital ecosystems against larger, more established enterprises. In their discussion of the effects of digital ecosystems on competitive strategy, Subramaniam et al. (2019) emphasise the necessity for businesses to use flexible and cooperative strategies. This study backs up this assertion by providing examples of how agile business models, strategic alliances, and ongoing innovation may help SMEs and start-ups become more competitive. This study's methodology for strategic management gives SMEs and start-ups useful advice on how to negotiate the complexities of digital ecosystems and achieve long-term success.

5.2 Practical implications

In practice, this research's findings provide start-ups and SMEs with tactics that enable them to prosper in digital ecosystems. Specifically, it is recommended that start-ups and SMEs use these phases as they navigate the world of digital ecosystems. Not only, do these strategies help SMEs and start-ups already working with digital ecosystems, but it also gives guidance to companies looking to delve into the world of digital ecosystems. By demonstrating to these organisations how to successfully plan for integration into digital ecosystems and emphasising the potential benefits of involvement. Understanding the phases highlighted in this research helps start-ups and SMEs succeed and expand within digital ecosystems. Implementing these methods also helps firms remain competitive and inventive in a constantly changing digital market. As a result, our study is a crucial asset for firms looking to improve their digital presence and competitiveness. Start-ups and SMEs are able to position themselves for success in the growing digital environment by putting the advised approaches into action.

Additionally, this research provides ecosystem builders with knowledge about supporting SMEs and start-ups. Showing what phases are important for smaller firms to improve on when working in ecosystems while also emphasizing that topics like collaboration, resource management, innovation, and dynamic capabilities are essential for smaller firms to thrive in ecosystems. Therefore, this research assists ecosystem builders in helping SMEs and start-ups in successfully navigating and scaling in the digital ecosystems landscape. To conclude, this research's framework should be implemented by the smaller firms but also by parties assisting SMEs and start-ups, to allow these smaller firms to effectively navigate and scale in the digital ecosystems.

5.3 Limitations

Despite the great insights provided by conducting interviews, this study has a few limitations. First, the study is based on a specific range of specialists, which may not represent the entire range of experiences and techniques used by SMEs and start-ups across regions and industries. This limits the findings' generalizability and emphasises the need for more study with a bigger and more varied population.

Secondly, the study depended on qualitative data from interviews, but during the research, all procedures were used to reduce the possibility of biased and subjective outcomes, and the research was overlooked by colleagues. However, because quantitative study outcomes are mostly reliant on interpretation, there is still a possibility that the research could be biased and subjective. It would be beneficial for future research to incorporate quantitative data to provide a more comprehensive analysis. Additionally, utilising multiple methods of data collection could help to strengthen the validity and reliability of the findings.

Furthermore, while this report shows several general techniques that may be applied to a variety of industries, it does not go into detail about sector-specific difficulties and possibilities. Different sectors confront diverse difficulties and possibilities, and a more in-depth investigation of sector-specific dynamics may yield more specialised advice. This will broaden the scope of the findings and give greater insights into the unique requirements and strategies of various sorts of enterprises.

Given the rapid speed of technological progress, the solutions described in this study may soon become redundant. Continuous study is required to stay up with new advancements and their consequences for SMEs and start-ups. As new technologies develop and market dynamics change, continual research will be required to update and enhance tactics for navigating and growing in digital ecosystems.

Finally, the study was primarily conducted in the Netherlands, a unique geographic and cultural setting. This may restrict the findings' application to other places. This unique focus on Dutch corporations may have an impact on the findings' generalizability, as the way companies operate, digital ecosystems dynamics, and market conditions varies greatly among nations and cultures.

5.4 Future research

Future research should overcome these limitations and investigate new aspects of SMEs and start-ups working in digital ecosystems. Expanding the sample to include a wider and more diversified set of SMEs and start-ups from various sectors and industries will allow for a more thorough understanding of the techniques used in different circumstances. This will improve the findings' generalizability and provide insights into the specific difficulties and possibilities encountered by organisations in various geographical and industrial situations. Future study should also include cross-cultural comparisons to investigate how diverse environments impact the tactics of SMEs and start-ups in digital ecosystems.

Combining quantitative data with qualitative results strengthens the research and allows for more generalizable conclusions. Surveys, case studies, and statistical analysis might supplement qualitative interviews, providing a more complete picture of the techniques used by SMEs and start-ups. Quantitative data might assist confirm qualitative findings and give further evidence to back up the study's results.

Future study should look at how future technologies like blockchain, the Internet of Things, and advanced artificial intelligence affect the tactics and competitive dynamics of SMEs and start-ups. Understanding how these technologies may be used will be critical for remaining competitive in fast changing digital environments. Studies that investigate the use and effect of these technologies might give useful information for firms looking to incorporate them into their business processes.

Investigating the role of government and institutional policies in assisting SMEs and start-ups within digital ecosystems might offer policymakers with useful information. This might lead to the establishment of more effective support structures, allowing SMEs and start-ups to prosper. Research on the efficacy of various governmental interventions and support programmes can help to shape efforts that promote innovation, development, and competitiveness among small businesses.

Finally, studying the relationship between human capital and technology tools in generating corporate performance may provide additional insights. Understanding how people' skills, knowledge, and capacities interact with technology tools to improve corporate performance may give a more comprehensive picture of the aspects that influence success in digital ecosystems. Studies that look at the effects of training, education, and workforce development on the ability of SMEs and start-ups to effectively exploit digital technology would be very useful.

6. CONCLUSION

This study establishes a complete framework for SMEs and start-ups to navigate and succeed in digital ecosystems. By emphasising agility and adaptation, collaborative ecosystems, customer-driven innovation, scalability and expansion, strategic resource management, and technology integration, SMEs and start-ups may develop the dynamic capabilities required to compete effectively in the age of digitization. This framework provides useful insights for smaller firms, managers and researchers interested in understanding and promoting the growth and success of SMEs and start-ups within digital ecosystems.

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9. APPENDIX

9.1 Appendix A – Interview guide

Companies

Part 1. Introduction

Thank you for agreeing to participate in this interview. My name is Mart Schluter, and I am researching to understand in what way smaller companies can scale up their businesses and navigate in the digital ecosystems landscape.

This interview consists of multiple open-ended questions and will take approximately 45 minutes. With your permission, I will make an audio recording of this interview so that I can transcribe it later. To ensure anonymity, names that may be mentioned will be removed from the research report and transcript of the interview. Also, if in any case you would like to terminate this interview, you can let me know. Do you have any questions before we begin the interview?

Can you briefly tell me something about yourself and the business you are working for?

Are you already using or planning to use digital ecosystems within your business? And, why?

Part 2. Digital ecosystems and platforms

What is your view on digital ecosystems? Are digital ecosystems the way to go in the future?

Why should companies move into the market of digital ecosystems? Or why not? And why did you move into the market?

What are the opportunities and challenges you have identified in digital ecosystems?

Part 3. Strategic management

What, in your opinion, are the key success factors (KSFs) for companies competing in digital ecosystems?

What key performance indicators (KPIs) or metrics are you using? How are they affecting your company's success in ecosystems?

What strategies are you using to reach the developed KPIs and be successful in digital ecosystems?

Do you think successfully navigating your company has a high level of risk? Why or why not?

As collaboration is an important factor in ecosystems, is the strategic management of ecosystems on a collaborative basis? Or does every company decide on their own strategies?

Part 4. Dynamic capabilities

How do you approach the scanning for opportunities and threats in the environment related to the ecosystem? Is this successful? Why or why not?

How do you seize the identified opportunities in the environment? Is this successful? Why or why not?

How do you keep transforming the dynamics in in the ecosystems in order to stay competitive? Again, is this successful? Why or why not?

How do you keep improving your business to keep up with the evolving technological advancements and changing market dynamics?

Are there other capabilities that helped to be successful in ecosystems? Can you identify these other capabilities?

What capabilities are missing in your company to be even more successful in ecosystems?

What role does leadership have in making sure these capabilities are being measured and managed?

Part 5. Finalization

Is there anything else you would like to share which we have not discussed? Or do you want to add something to what we discussed?

Thank you for your time and valuable insights.

Ask if the interviewee is interested in receiving a digital copy of the thesis once it is finished.

Experts

Part 1. Introduction

Thank you for agreeing to participate in this interview. My name is Mart Schluter, and I am researching to understand in what way smaller companies can scale up their businesses and navigate in the digital ecosystems landscape.

This interview consists of multiple open-ended questions and will take approximately 45 minutes. With your permission, I will make an audio recording of this interview so that I can transcribe it later. To ensure anonymity, names that may be mentioned will be removed from the research report and transcript of the interview. Also, if in any case you would like to terminate this interview, you can let me know. Do you have any questions before we begin the interview?

Can you briefly tell me something about yourself and your field of expertise?

Part 2. Digital ecosystems and platforms

What is your view on digital ecosystems? Are digital ecosystems the way to go in the future?

Why should companies move into the market of digital ecosystems? Or why not?

What are the opportunities and challenges for companies in digital ecosystems?

Part 3. Strategic management

What, in your opinion, are the key success factors (KSFs) for companies competing in digital ecosystems?

What key performance indicators (KPIs) or metrics should companies be using? How are they affecting a company's success in ecosystems?

What strategies should companies be using to reach the developed KPIs and be successful in digital ecosystems?

Do you think successfully navigating a company has a high level of risk? Why or why not?

As collaboration is an important factor in ecosystems, is the strategic management of ecosystems on a collaborative basis? Or does every company decide on their own strategies?

Part 4. Dynamic capabilities

How should companies approach the scanning for opportunities and threats in the environment related to the ecosystem? Is this successful? Why or why not?

How should companies seize the identified opportunities in the environment? Is this successful? Why or why not?

How should companies keep transforming the dynamics in in the ecosystems in order to stay competitive? Again, is this successful? Why or why not?

How should companies keep improving their business to keep up with the evolving technological advancements and changing market dynamics?

Are there other capabilities that can help to be successful in ecosystems? Can you identify these other capabilities?

What capabilities are missing in most companies to be even more successful in ecosystems?

What role does leadership have in making sure these capabilities are being measured and managed?

Part 5. Finalization

Is there anything else you would like to share which we have not discussed? Or do you want to add something to what we discussed?

Thank you for your time and valuable insights.

Ask if the interviewee is interested in receiving a digital copy of the thesis once it is finished.

9.2 Appendix B – Conceptual model

First-order themes	Second-order concepts	Aggregate dimensions
Smaller companies can implement and adapt new tools faster than large corporations.	Agile organizational structure	Agility and adaptation
Adapting to rapid technological changes can be challenging for start-ups.		
Effective management involves making informed decisions on new technologies.		
Digital tools help start-ups stay agile and responsive to market trends.	Adaptive market strategies	
Monitoring market dynamics and transferring solutions across domains is beneficial.	Environmental scanning and market sensing	
Learn from competitors who failed to understand market needs.		
A company's ability to adapt to market opportunities is essential.		
Agile methodologies help start-ups respond quickly to market changes.		
Constant learning and adaptation are vital for leveraging new technologies.		
Continuous improvement of digital strategies is essential for long-term success.		
Keeping track of technological progress and market conditions is essential.		
Ensuring trust and data security in digital ecosystems is essential.	Ecosystem integration	Collaboration driven ecosystems
A digital ecosystem includes multiple business models and interests.		
Organizations join ecosystems for various benefits beyond monetary gains.		
Digital ecosystems require collaboration and mutual benefit.	Collaboration and networking	
Digital ecosystems enable connecting and meeting new people and opportunities.		
Networking and partnerships are essential for startup success in digital ecosystems.		
A give-back culture among founders helps grow companies.	Leveraging partnership	
Interaction between small agile companies and large ones fosters innovation.		
Digital platforms facilitate knowledge sharing and collaboration.		
Developing appropriate and fitting KPIs is relevant	Market intelligence	Customer-driven innovation
Focus on early adopters who have a problem, are looking for a solution, and have a budget.		
Feedback loops from customers guide product development.	Feedback driven improvement	
Start-ups should focus on product-market fit and gather customer feedback.		
Start-ups should continuously monitor and adapt to customer behaviour.		

A company's ability to grow requires continuous adaptation to market changes.	Growth opportunities	Scalability and growth
Digital transformation reduces costs and increases operational efficiency.		
Using AI and analytics tools helps scale operations efficiently.		
Start with a core service and be prepared to scale up.	Ability to scale	
Scaling software requires a prepared yet flexible architecture.		
Amazon's growth from a bookstore to a global retailer exemplifies scaling from small beginnings.		
Having a clear, simple, and manageable process for collaborations is crucial.	Effective resource management	Strategic resource management
Start-ups need to keep processes simple to manage growth effectively.		
Clear communication and leadership are essential for team alignment.		
Start-ups often miss time management and proper documentation.		
Hiring the right people who understand new technologies is crucial.		
Complexity increases with business growth, necessitating efficient digital tools.	Strategic use of digital tools	
Digital tools enable start-ups to document and share their growth journey.		
Digital tools enable start-ups to manage remote teams effectively.		
Utilizing open-source technology and analytics is vital for platform development.	Technology utilization	Digital transformation
Digital transformation involves integrating technology into all business aspects.		
Data analytics is crucial for monitoring user behaviour and improving services.		
Social media and digital tools are essential for outreach and customer engagement.	Technological adaptation	
Staying updated with new technologies is critical to avoid being left behind.		
Balancing innovation and challenges requires continuous testing of new technologies.		