LUND UNIVERSITY
School of Economics and Management

Department of Business Administration

FEKH99

Bachelor Thesis in Entrepreneurship and Innovation

Autumn Semester 2022

Digitalisation of Start-Up Business Models

A qualitative multiple case study on the impact of digitalisation and its role for business model development

Authors:

Adam Thomson & Yara Khalil

Supervisor:

Joakim Winborg

Words: 18571

Sammanfattning

Examensarbetets titel: Digitalisering av nystartade företags affärsmodeller: En kvalitativ flerfallsstudie om effekterna av digitalisering och dess roll för affärsmodell utveckling

Seminariedatum: 11 Januari 2023

Ämne/Kurs: FEKH99, Examensarbete i Entreprenörskap och Innovation, 15 högskolepoäng

Författare: Adam Thomson och Yara Khalil

Handledare: Joakim Winborg

Nyckelord: Digitalisering, startups, värde, affärsmodeller, digitala affärsmodeller, digital transformering, digital outsourcing, digitala teknologier, entreprenörskap.

Forskningsfråga: Hur påverkar och utvecklar digitaliseringen startups affärsmodeller?

Syfte: Studiens syfte är att undersöka hur digitalisering påverkar entreprenörskap och hur nystartade företag skapar och utvecklar sina affärsmodeller som svar på digitala förändringar.

Metod: Studien är en kvalitativ flerfallstudie och data samlades in genom semistrukturerade intervjuer. Empirin består av citat från transkriberade intervjuer.

Teoretiska perspektiv: Det teoretiska ramverket för studien var fokuserat på digitala teknologier, affärsmodeller, digital transformation av affärsmodeller och en teoretisk modell

Resultat: Det empiriska materialet bekräftar tidigare forskning vad gäller digitaliseringen påverkan på affärsmodeller samt hur digitala teknologier och digital utkontraktering används för att utveckla affärsmodeller.

Slutsats: Digitaliseringen bidrar med både möjligheter och utmaningar för nystartade företag och deras utveckling. Externa drivande faktorer såsom COVID-19 kan ha stark påverkan på hur digitaliseringen utvecklas och därmed företags affärsmodeller till följd. Implikationerna av studien tyder på att företag och forskare började öka uppmärksamheten på implementeringen av digitalisering för att förbättra utvecklingen av affärsmodellens olika delar för effektiv anpassning och hävstångskraft.

Abstract

Title: Digitalisation of start-up business models: A qualitative multiple case study on the impact of digitalisation and its role for business model development

Seminar date: January 11th 2023

Course: FEKH99, Bachelor Degree Project in Entrepreneurship and Innovation Management, Business administration, Undergraduate level, 15 University Credit Points

Authors: Adam Thomson and Yara Khalil

Supervisor: Joakim Winborg

Keywords: Digitalisation, start-ups, value, business models, digital business models, digital transformation, digital outsourcing, digital technologies, entrepreneurship.

Research Question: How is digitalisation impacting and developing start-ups' business models?

Purpose: The study's purpose is to examine how digitalisation affects entrepreneurship and how start-ups create and develop their business models in response to digital changes.

Methodology: The study is a qualitative multiple case study and the data was collected through semi-structured interviews. The empirical data consist of citations obtained from interview transcripts.

Theoretical Perspective: The theoretical framework for the study was focused on digital technologies, business models, digital transformation of business models, and a theoretical model.

Result: The empirical material confirms previous research regarding digitalisation's impact on business models and how digital technologies and digital outsourcing are used to develop business models.

Conclusion: Digitalisation brings both opportunities and challenges for start-ups and their development. External driving factors such as COVID-19 can strongly impact how digitalisation develops and, thus, companies' business models. The implications of the study incline that companies and researchers began to pay more attention to the implementation of digitalisation to improve the development of the different parts of the business model for effective adaptation and leverage.

Acknowledgements

With the help of incubators, we got in touch with relevant entrepreneurs, who significantly helped our study. There were six different industries with different ideas. Each start-up was unique and full of lessons and experiences we take into working life. We appreciate and thank all incubators and the six entrepreneurs who took the time to sit with us.

A big thank you to our supervisor, Joakim Winborg. Your insight and support have been well needed. You have given us constructive criticism, and you helped us see the light with your support and comments.

We would also like to thank John-Erik Hassel, entrepreneurship researcher and former professor at Karlstad University, for his support, insight, and ideas throughout the thesis.

Finally, we would like to thank family and friends for their unconditional encouragement when things did not always go as planned and their unconditional support throughout the thesis.

Place: Lund
Date: 9 January 2023

Adam Thomson

Yara Khalil

Table of contents

1 Introduction **7**
1.1 Background 7
1.2 Problem discussion 9
1.3 Purpose 10

2 Theory **11**
2.1 Digital Technologies and Digital Outsourcing 11
2.1.1 Digital artifacts 11
2.1.2 Digital platforms 12
2.1.3 Digital infrastructure 13
2.1.4 Digitalisation and external enablers 15
2.1.5 Digital Outsourcing 15
2.2 Business Model 16
2.2.1 Offer 16
2.2.2 Infrastructure 17
2.2.3 Customers 17
2.2.4 Financial viability 18
2.3 Digital Transformation of Business Models 19
2.4 Theoretical Model 20

3 Methodology **21**
3.1 Research Strategies 21
3.2 Research design 22
3.3 Literature selection 23
3.4 Sampling 24
3.5 Data collection 26
3.5.1 Background 27
3.5.2 The impact of Digitalisation and Business Model changes 27
3.6 Data analysis 28
3.7 Reliability and validity 29
3.8 Ethical considerations 30
3.9 Limitations 31

4 Empirical findings **32**
4.1 Company A 32
4.1.1 Background 32
4.1.2 Impact of Digitalisation and Business Model changes 32
4.2 Company B 34
4.2.1 Background 34
4.2.2 Impact of Digitalisation and Business Model changes 34
4.3 Company C 36
4.3.1 Background 36
4.3.2 Impact of Digitalisation and Business Model changes 36

4.4 Company D 37
4.4.1 Background 37
4.4.2 Impact of Digitalisation and Business Model changes 38
4.5 Company E 40
4.5.1 Background 40
4.5.2 Impact of Digitalisation and Business Model changes 40
4.6 Company F 43
4.6.1 Background 43
4.6.2 Impact of Digitalisation and Business Model changes 43
4.7 Summary 45

5 Analysis 48
5.1 Impacts and changes on the offer due to digitalisation 48
5.2 Impacts and changes on the infrastructure due to digitalisation 50
5.3 Impacts and changes with customers due to digitalisation 52
5.4 Impacts and changes on the financial viability due to digitalisation 55
5.5 Revised Theoretical Model 56

6 Conclusion & Discussion 59
6.1 Conclusions 59
6.2 Discussion 60
6.3 Theoretical Implications 62
6.4 Entrepreneurial and Practical Implications 62
6.5 Suggestions for further research 63

References 65

Appendix 79
1 Intervjuguide (Svenska) 79
2 Interview guide (English) 82

1 Introduction

The following chapter presents the background for the specific research area. From it follows a problem discussion which lays the foundation for the study's purpose and, finally the research question.

1.1 Background

During the last decades, there has been a rapid increase in new technology, digital evolvement, and the amount of data and information transferred, stored, and used. More than 90% of technological memory changing to digital, and overall a continuous transformation from analog to digital (Hilbert & López, 2011), also known as digitisation (Verhoef, Broekhuizen, Bart, Bhattacharya, Dong, Fabian & Haenlein, 2021). This change has led to an almost 100% digital format usage of telecommunication. In addition, digitalisation emerges when digitisation integrates into society and businesses by changing the social and technical aspects of infrastructure (Tilson, Lyytinen & Sørensen, 2021). These changes also cause new opportunities and challenges for societies, businesses, and start-ups (Verhoef et al. 2021). For this study, start-ups are referred to as unique and independent establishments with active trading or have hired the first employee (Luger & Koo, 2005) and registered for a maximum of ten years (Reynolds & Miller, 1992).

Entrepreneurship represents the activities and business relationships, which can be a person creating a start-up (Nationalencyklopedin, 2023). Traditional entrepreneurship as a form of seeking and forming opportunities to exploit (Venkataraman, 1997), with a focus on creating and delivering value (Hisrich & Kearney, 2014), is changing to digital entrepreneurship and adapting to a digital era (Le Dinh, Chien Vu & Ayayi, 2018). Digital entrepreneurship includes start-ups and business transformations, creating or implementing digital technologies (Ning, Valerie & Calvin, 2018). "In general, any entrepreneurial activity that transfers an asset, service or major part of the business into digital can be characterised as digital entrepreneurship" (Kraus, Palmer, Kailer, Kallinger & Spitzer, 2018, p.354). Moreover, the concept of digital technologies mainly consists of digital artefacts (software and hardware components), platforms (places for networking and trading), and infrastructure (tools and

systems for communication) (Nambisan, 2017). Additionally, digital technologies can significantly develop and enhance business models (Nambisan, 2017; Ritter & Pedersen, 2020).

Business models, the representation of value propositions, value creation, and capture of value in a business or start-up (Zott, Amit & Massa, 2011), are also affected by digitalisation (Ritter & Pedersen, 2020; Verhoef et al. 2021). Digitalisation is inducing the formation of new business models. New business models adapted for a digitalised environment have the potential to find new opportunities to create and deliver more customer value with digital technology (Kraus et al. 2018). Digitalisation and technological changes are creating new forms of start-ups with new channels (online streaming), customised offers (Uber), and networking platforms (Linkedin). It helps satisfy unique customer needs and creates more potential business opportunities (Elia, Margherita & Passiante, 2020). Business models are a part of a digital transformation, as their fundamentals are becoming digitalised (Veit, Clemons, Benlian, Buxmann, Hess, Kundisch, Leimeister, Loos & Spann, 2014; Verhoef et al. 2021). Additionally, the pace of digitalisation has recently accelerated due to external enablers, such as COVID-19, impacting business models and their development (Herath & Herath, 2020; Puddister & Small, 2020; Lowenthal et al. 2020).

Digitalisation opens up channels for interactions between businesses and customers, thus increasing the potential of understanding customers' needs and how to provide value accordingly (Lemon & Verhoef, 2016). It increases the need for flexibility within businesses to respond to rapid market changes, creating an increase in competition and challenging former cost structures (Verhoef et al. 2021). New possibilities for start-ups', to grasp market shares emerge by being adaptable and evaluating potential customer needs more effectively. Moreover, the market capitalisation is realised by looking at the number of internet users passing over five billion this year (Statista, 2022a), an increase of about 100% within the last ten years (Statista, 2022b). Additionally, the average person spent more than three hours a day online in 2021, compared to about one hour in 2011 (Statista, 2022c).

1.2 Problem discussion

Recent studies show how digitalisation impacts entrepreneurship in several ways, including ways digital technology applies to improve performance, reduce costs, and take advantage of a broader demand. However, there are still limitations within digital entrepreneurship and technology, and further research is needed (Rosin, Proksch, Stubner, & Pinkwart, 2020). Moreover, digital technologies can overcome a lack of valuable information that will reduce risks and induce better market accessibility and adaptability. The literature addresses the benefits of implementing digitalisation to enhance value propositions. Nevertheless, they have arguments for further research (Hervé, Schmitt & Baldegger, 2020). The indicated importance and need for more research within each field, therefore, adds to the interest and relevance of this study to further explore digitalisation, entrepreneurship, and value propositions.

During the last decade, digital transformation has given researchers a further interest in the subjects of digital business models and digital startups, highlighting the value of business models and the need to adapt them for digital change (Verhoef et al. 2021; Broekhuizen, Broekhuis, Gijsenberg & Wieringa, 2021). Digitalised processes and technologies are used and valued differently depending on the value propositions (in products and services), value creation (partnership), and value delivery (distribution). However, these findings need more samples. Further empirical studies are valuable to confirm and develop the insights and research between business models and digital entrepreneurship (Ropposch, Stiegler & Gubik, 2021). Additionally, the importance of the business model links to how the main reason for business failure among start-ups was a defective business model in almost 20% of the cases in 2018 (Statista, 2022d). Moreover, the field needs a framework for how start-ups should integrate different digital technologies into their business model (Zaheer, Breyer & Dumay, 2019). Given the inadequacy of existing research within the fields, the value of business models for start-ups and a lacking theoretical frame add to the study's importance, both for practical and theoretical implications.

Furthermore, digital technologies are changing how value originates within entrepreneurship and transforming business models (Jafari-Sadeghia, Garcia-Perez, Candeloc & Couturier, 2021). Digital platforms can significantly affect the value propositions (Ruggieri, Savastano, Scalingi, Bala, D'Ascenzo, 2018), together with AI for improving innovation and product

development (Aghion, Jones & Jones, 2017), while big data (a large amount of disorganised data) and data analytics can help capture value and opportunities (Nambisan, 2017; Urbinati, Bogers, Chiesa & Frattini, 2019). Research shows that including big data can lead to better products and services with more informed decisions for capturing value (Cappa, Oriani, Peruffo & McCarthy, 2021), increasing efficiency and lower costs (Urbinati et al. 2019). Digital outsourcing is promising for enhancing value creation (Mazumder & Garg, 2021), with external providers supporting development and infrastructure (Bhimani & Willcocks, 2014). Additionally, digital platforms like LinkedIn can help create channels with customers for value delivery (Alaimo, Kallinikos & Valderrama, 2019). Nevertheless, the research on how digital technologies contribute to value capture is still in the early stages. Together with how potential payoff for digital investments occurs and how to integrate these digital technologies into the business model (Parida, Sjödin & Reim, 2019). Additionally, most of these studies are not on start-ups or entrepreneurial environments. Thus it becomes interesting to investigate any potential relevance and effects these digital technologies have for creating and capturing value regarding entrepreneurship and start-ups.

1.3 Purpose

The purpose is to examine how digitalisation affects entrepreneurship and start-up business models. Moreover, how they can and are creating and developing their business models due to digital change. What challenges and opportunities arise from digitalisation, and how are business models adapted to enhance their value propositions while creating, delivering, and capturing more value. The study also intends to explore ways start-ups can integrate digital technologies into their business models and use external digital providers to further contribute to that process and understand its effects. The following research questions seek to answer the purpose of the study:

- *How is digitalisation impacting and developing start-ups' business models?*

2 Theory

This chapter discusses theoretical aspects of the study related to digitalisation and start-ups' business models. The chapter comprises three major sections: first, digital technologies and digital outsourcing, which include digital artifacts, platforms infrastructure, and outsourcing as vital factors and enablers of digitalisation. Second, the business model introduces the concept through two primary frameworks in the study. They compromise four fundamental areas (offer/value propositions, *infrastructure/value creation*, *customers/value delivery*, and *financial viability/value capture). Additionally, the digital transformation of business models and, finally, presenting a theoretical model that visualises the theoretical connections.*

2.1 Digital Technologies and Digital Outsourcing

Digital technologies include various electronic tools, systems, resources, and devices businesses and individuals use to generate, store or process data. The principal categories of digital technologies include *digital artifacts*, *platforms,* and *infrastructure*. *Digital artifacts* represent software and hardware parts that can merge into different physical devices or digital platforms to function effectively (Nambisan, 2017). *Digital platforms* are multi-functional and contain several meanings. However, avoiding the technical parts, such as the integration with digital artifacts, can be understood as a means for users to connect or trade while matching need, demand, and supply (Reuver, Sørensen & Basole, 2018). Lastly, *digital infrastructure* can mean "*digital technology tools and systems that offer communication, collaboration, and/or to support innovation and entrepreneurship*" (Nambisan, 2017, p. 1032).

Digitalisation and digital technologies show superior capabilities of reducing staff, increasing the pace of information transactions, and creating market flexibility for start-ups. They are beneficial in lowering costs and creating time-effectivity and market flexibility for start-ups. Adding more digitalisation is levering all factors positively. It also increases efficiency and facilitates collaboration with digital technologies (Rosin et al. 2020).

2.1.1 Digital artifacts

Digital artifacts or objects are flexible, replaceable, and developed continuously. Their support of digital platforms such as websites can be changed and modified constantly to suit

specific organisational or individual needs. Digital artifacts can investigate the gathered core in objects while typically being mergeable or synced with other digital things (Kallinikos, Aaltonen & Marton, 2013). Above mentioned capabilities or attributes can help create value opportunities for entrepreneurs by combining different digital artifacts. Examples of this are within the healthcare industry and advertising when compounding big data, data analytics, and the Internet of Things (IoT), leading to enhanced efficiency and the formation of new value (Nambisan, 2017).

2.1.2 Digital platforms

Digital platforms have different characteristics, and it is possible to divide them into four areas. First, as a collective or environment where developers can bridge or sell their products and services, an *innovation platform*. An example of this can be app development platforms like Apple iOS or Google android (Evans and Gawer, 2016). Users can build apps and display them for sale in an app store. "Common monetization approaches include in-app purchases, subscription payments, premium features, ad revenue, selling user data, and traditional paid apps." (Jabangwe, Edison & Duc, 2018, p. 109). It can also be helpful with an effective process concerning app development due to the rapidly evolving field to stay competitive (Jabangwe, Edison & Duc, 2018). Other examples are the cloud platforms Amazon Web Services (AWS), Microsoft Azure, and Google cloud platform (GCP). They simplify the technical aspects of a business and create solutions to help store and navigate through large amounts of data. Moreover, they include services like big data, analytics, cloud AI, and other valuable tools to reduce costs in a business and help growth (Mufti, Mittal & Gupta, 2020; Kotas, Naughton & Imam, 2018).

The second type of digital platform is a transaction platform. The role of transaction platforms is to help and create opportunities for individuals and businesses to trade (Google Search and Amazon Marketplace) (Evans & Gawer, 2016). Other examples of these platforms are LinkedIn, Youtube, and Instagram. Moreover, these transaction platforms function for trading content, data, and resources. The transactions, with most importantly digital data, give value to the platform through users and connected resources. Simultaneously value is created that other users can extract. It becomes a networking ecosystem (Alaimo, Kallinikos & Valderrama, 2019). Youtube function as a transaction platform and is beneficial for accessing informational videos. It provides a large amount of

content with easy access to the users' specific needs. Furthermore, using LinkedIn is highly popular and advantageous within the business environment (Yang, Basile & Letourneau (2020). Networking on LinkedIn remarkably positively affects informational benefits related to business (Banerji & Reimer, 2019; Utz & Breuer, 2019).

Third, combined innovation and transactions platforms, which include creating apps or software through innovation platforms and, after that, become available as transaction platforms and merged as *integrated platforms*. Three prominent examples are Google, Apple, and Facebook (Evans & Gawer, 2016). The fourth type of digital platform is an investment platform. These are specialised in combining and controlling or influencing several platform companies, connecting the customer with the company as a form of linkage. Investment platforms act as holding companies; some examples are Softbank, Naspers, and Priceline (Evans & Gawer, 2016).

With the rapidly evolving technology regarding digital platforms and the competitive field, it can take time for developing entrepreneurs to gain momentum. Many different platforms make it crucial to be unique, quickly accumulate appropriate resources, and build legitimacy. It is also essential for entrepreneurs to use digital platforms to create the most value, which usually correlates with a higher amount of site users. The right digital platforms can significantly enhance the networking effect, which is especially important for entrepreneurs in the early stages of their businesses. Additionally, it contributes to valuable tools for developing their products or services with higher quality, faster than the competition (Srinivasan & Venkatraman, 2017).

2.1.3 Digital infrastructure

Developing a successful digital infrastructure can be narrowed to *innovation, adoption, and scaling mechanisms.* The *innovation mechanism* supports an open and flexible atmosphere where digital infrastructure is connected in new ways, leading to enhanced development. For example, combining internal (personnel) and external resources (vendors) creates an environment where new innovative products and services emerge automatically. The *adoption mechanism* represents the evolving adaption of a product or service. It is when a user or customer gets involved with a resource (service or prototype), growing its acceptance and reach. Simultaneously, more resources integrate to improve and develop the

infrastructure, raising its value even further. The *scaling mechanism* reflects the growth of the digital infrastructure with external leverage. It can be through partners forming collaboration due to the easy access provided by an open network and shareable infrastructure, making it grow faster and better (Henfridsson & Bygstad, 2013).

Digital and social media marketing are other digital infrastructures that show significant benefits for start-ups'. The more prominent usage of this type of marketing typically correlates with higher popularity for a product or service. It creates a repeated circle of raising sales, growth, and revenue. Social media marketing is crucial for many start-ups, increasing their profits and revenue through expansive visibility and increased market share (Poddar & Agarwal, 2019). Additionally, marketing automatisation based on customisation from the customers' digital footprints can be used as customer relationship management, reducing costs and increasing revenues. An example can be with using automated newsletter campaigns (Courchesne, Ravanas & Pulido, 2019). Moreover, the potential of AI is further adding to the area of automatisation, where the knowledge increase leads to economic revenue gains. It also encourages innovation, generating more ideas and benefiting production technology. Nevertheless, there are still challenges and limitations to some advanced areas where complete automatisation is impossible, not excluding the human factor and thus capping the growth potential. Moreover, businesses using a high degree of AI are also inclined to outsource many tasks requiring lower skills (Aghion, Jones & Jones, 2017).

Both independently and combined, cloud computing, big data, and data analytics are other robust digital infrastructures. For example, as mentioned before, the three prominent actors, Google, Microsoft, and Amazon, combine digital infrastructures and create practical tools for processing and analysing a large amount of data on their clouds (Berisha, Mëziu & Shabani, 2022). The digital infrastructures create "a faster and efficient way to integrate, transform and visualize different types of data" (Berisha, Mëziu & Shabani, 2022, p. 5).

Furthermore, other examples of digital infrastructure that provide value are virtual prototyping and 3D printing, which create a more realistic representation of an object (Nambisan, 2019). They make digital versions of physical things more efficient, cost- and time-effective. Virtual prototypes also have the benefits of being higher in replicability and flexibility than physical products. However, they are underperforming in validity and tangibility (Kent, Snider, Gopsill & Hicks, 2021).

2.1.4 Digitalisation and external enablers

The pandemic of COVID-19 caused companies and industries to reframe their business and transform it digitally. It was a factor that rapidly changed the pace of digitalisation concerning how businesses needed to adapt their work environment. It introduced a rapid and necessary adaption and acceptance of digital technologies (Herath & Herath, 2020). Working from home became the new norm and with it followed opportunities and challenges. Some of the opportunities were related to flexibility and productivity for specific jobs, while some challenges were due to longer working hours and managers being unable to track their employees' work. Additionally, the new environment brought changes in communication, where digital technologies like video conferences got more popular (Bolisani, Scarso, Ipsen, Kirchner & Hansen, 2020). COVID-19 forced changes in societies and organisations, influencing a rapid transformation to digital meetings with digital technologies such as Zoom (Puddister & Small, 2020; Lowenthal et al. 2020).

Furthermore, COVID-19 was an external enabler that brought rapid awareness for supporting alternatives that previously experienced skepticism and resistance, like digital technologies. Nevertheless, even if those technologies proved to contain abilities to scale and improve the businesses while also creating significant competitiveness, it was not until business failure could be evident that progress occurred (Akpan, Soopramanien & Kwak, 2020). Additionally, on a societal level, there are significant differences in how generations implement and use digital technologies in their daily lives. The younger generations are brought up with digital technologies and thus better accelerate their ability to adapt, learn and accept the ongoing changes concerning the digital transformation of infrastructure. Their eagerness to learn and develop within the area transforms the business landscape, where younger people tend to evolve faster with digital technologies than the older generations (Berkup, 2014).

2.1.5 Digital Outsourcing

Digitalisation and digital transformation of existing business models are increasing the importance of specialised external competence for the function and leverage of the business. The service providers in the outsourcing field are adapting to a new form of value creation and supporting a new need in the digital era. Digital technology is a significant driver of this development since data and information can be exchanged and transferred more accessible

and entirely distant. It benefits a new type of flexibility, increasing value due to higher efficiency and lower costs (Mazumder & Garg, 2021). Moreover, digital outsourcing includes a broader collection of services, making it possible to outsource applications, infrastructure, and accounting services. It creates various possibilities to enhance the internal business model with external providers. However, some challenges exist regarding matching the correct competence and service for the inclined task, adding potential risks while accounting for transactional costs (Bhimani & Willcocks, 2014).

2.2 Business Model

According to Zott, Amit & Massa (2011), the concept and definition of the business model are widespread, and no simple and holistic explanation exists among scholars. However, four common themes exist. First, value focus is evident in all scholars and consists of how value is created and captured through value propositions concerning the customers. Second, it represents uniqueness while thirdly covering the offering and how it is created and delivered. Lastly, it reflects connections to activities and linkages to different internal and external stakeholders, with an ultimate focus on value. DaSilva and Trkman (2014) add that the business model should be interpreted as an ongoing process, reflecting the business at a given time and functioning as a support for the overall strategy.

Furthermore, the Business Model Canvas (BMC) covers the most significant factors in a business model and presents the fundamentals of the business simplistically. It consists of nine building blocks, included and presented in four main areas in a company: *offer*, *infrastructure*, *customers*, and *financial viability*. It reflects the strategy executed through organisational systems, processes, and structures (Osterwalder & Pigneur, 2010). Additionally, it will be used as a structural frame, complemented by the four parts of Richardson's (2008) business model framework, describing the business strategies and thinking process. The following components are fundamental for the framework; *value propositions*, *value creation*, *value delivery system*, and *value capture*.

2.2.1 Offer

A fundamental part of the business model is the company's *value propositions*, reflecting why customers rely on one company over another to solve their problems or meet their needs. The value proposition is the collection of benefits via products and services that a company offers its customers. It represents what the business sells and to which targeted customer or market.

Some are innovative, representing new or disruptive products, while others are similar to existing market products but have additional features and attributes (Osterwalder & Pigneur, 2010). Additionally, value propositions show if the business offers something unique and more valuable while attracting customers and creating competitiveness (Richardson, 2008). Innovative value propositions are essential in fast-changing markets with high competition, generally with a high degree of technology, impacting the business models and their development to meet new customer needs (Teece, 2010). The strength of the business value proposition rests on its strategic positioning (Richardson, 2008).

2.2.2 Infrastructure

The three subsequent building blocks in the business model canvas, *key partners, activities,* and *resources*, represent some of the business's core parts to function. *Key partners* constitute the network of partners and suppliers. Companies create alliances to decrease the risks, obtain resources or optimise the business model. Three motivations for establishing a partnership are; the acquisition of particular activities and resources, reduction of risk and uncertainty, optimisation, and economy of scale. *Key activities* and *resources* help create and deliver value propositions, attain markets, preserve customer relationships, and obtain revenue. The former can include software development, supply chain management, and problem-solving, while the latter is financial, intellectual, human, or physical. Additionally, they can be leased or owned by either the company or obtained from the key partners (Osterwalder & Pigneur, 2010).

The value creation system is related to the infrastructure, which includes the various activities a firm initiates to create and produce what it offers to customers. Value creation concerns all significant stakeholders in the business, internal (personnel) and external (cooperation) (Biloshapka & Osiyevksyy, 2018). It is a part of how the business competes and implements its competitiveness (Richardson, 2008). Furthermore, the value creation divides into four components, which strengthen each other and increase the value of the business model; efficiency (information transactions), novelty (innovation), lock-in (network shifting cost), and complementaries (additional offerings) (Amit & Zott, 2001).

2.2.3 Customers

The following three building blocks, *customer relationship, segments,* and *channels*, represent the interaction with the customers, who they are, and where the interaction is

happening. *Customer relationship* links the business and specific customer segments, personal or automated. Customer retention, customer acquisition, and boosting sales are motivations that can drive customer relationships. The *customer segment* defines different groups of people or organisations a company aims to serve and reach. Companies sometimes divide their customers into segments with everyday needs, behaviors, or other attributes to satisfy them better. It is vital to make conscious decisions about which customer segments to serve and which to ignore. Furthermore, *channels* serve multiple functions, including distribution, communication, and increasing customer awareness. It can be with the company's products and services, enabling customers to acquire specific services or products, supplying customers with post-purchase support, assisting clients in evaluating the company's value proposition, and delivering value propositions to customers (Osterwalder & Pigneur, 2010).

Furthermore, the area of customers relates to the value delivery system, the various activities a business does to deliver its offer or value propositions to customers (Richardson, 2008). The value delivery system relates to how the created value, in agreement with the customer, can be delivered economically (Biloshapka & Osiyevksyy, 2018).

2.2.4 Financial viability

The last part of the business model consists of building blocks, *cost structure*, and *revenue streams*. If a company identifies what customers are willing to pay, it can initiate one or more revenue streams from each customer segment. The revenue stream describes the cash a company initiates from each customer segment, which keeps the business going. At the same time, the cost structure represents all costs incurred to operate a business model (Osterwalder & Pigneur, 2010).

Additionally, the *value capture* complements the financial viability, which consists of the economic and revenue model. The former covers a firm's financial aspects, margins, and costs. It refers to expenses, income, and expenses that go into the profit equation while including the exchange time, competitively. The latter adds revenue and provides profit margins that exceed costs. It describes how a business receives money in substitution for products and services (Richardson, 2008). Some revenue models include subscriptions, sales, and advertising (Rappa, 2001). Furthermore, the economic and revenue model combined describes how the company makes money, where a creative and considerate approach to

capturing value is essential to building a successful business model (Richardson, 2008). Additionally, businesses need to be adaptable and continue to develop their business models to capture long-term value (Teece, 2010).

2.3 Digital Transformation of Business Models

Digital transformation exists on a societal level, representing changes regarding technology and information systems (Majchrzak, Markus & Wareham, 2016). Additionally, it impacts innovation and strategy development for organisations and businesses to meet new demands and take advantage of them (Matt, Hess, Benlian & Wiesbock, 2016). Another interpretation is "*a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies*" (Vial, 2019, p. 118). Additionally, the concept defines how these changes impact and transform the development of business models, how new business models better coordinate digital transformations, and what value they bring (Verhoef et al. 2021).

With digitalisation, new concepts such as digital business models have arisen, meaning that a "business model is digital if changes in digital technologies trigger fundamental changes in the way business are carried out, and revenues are generated" (Veit et al. 2014, p. 48). As business models are changing and becoming more digital, so does also their existing functions and representations of how value is created and captured. Digitalisation brings better access to information and knowledge for new creative ways to fulfill customers' needs and enhance their experiences (Rappa, 2001). Fitzgerald, Kruschwitz, Bonnet and Welch (2013) support the positive customer experience and engagement with the business, highlighting the area as the most beneficial development due to digital transformation. Moreover, they incline that internal communication and innovation are enhanced while digital technologies help develop new business models. It also eliminates complications in synchronising various digital business models to create and capture value. A type of boundary spanning since internal models easier can be interconnected and enhanced with other external companies' business models (Bharadwaj, El Sawy, Pavlou & Venkatraman, 2013). However, resistance and complications typically exist for a digital transformation within businesses. Three common factors are due to lack of sense of urgency to change, arguably too many costs for implementing digital development, and changing the system which currently functions (Fitzgerald, Kruschwitz, Bonnet & Welch, 2013)

2.4 Theoretical Model

Digitalisation is impacting and changing social and technical aspects of infrastructure (Tilson, Lyytinen & Sørensen, 2021), creating opportunities and challenges for businesses and start-ups' (Verhoef et al. 2021). Moreover, these changes affect business models and how they are developed with *digital technology* to benefit from digital changes (Kraus et al. 2018). Business models can develop in four significant areas; *offer, infrastructure, customers,* and *financial viability* (Osterwalder & Pigneur, 2010), complementing each area in the same order with; *value propositions, creation, delivery,* and *capture* (Richardson, 2008). The theory also indicates that digital technology could create and delivers more value to customers, improving innovation and developing communication and, thus, the overall business models (Nambisan, 2017). Other impacts are *digital outsourcing*, indicating higher presence and value due to digitalisation (Mazumder & Garg, 2021). Additionally, business models are changing and adapting to digital transformation (Verhoef et al. 2021), when digitalisation impact, creates and develops *digital business models* (Bharadwaj et al. 2013; Veit et al, 2014).

Based on the literature review, a theoretical model is created and presented below (**Figure 1.**). The theoretical model aims to facilitate and improve the analysis and present it structurally. It visualises the impact of digitalisation on start-ups' business models (offer/value propositions, infrastructure/value creation, customers/value delivery, and financial viability/value capture). Additionally, how digital technology and digital outsourcing are implemented and developing start-ups' business models to adapt and benefit from digital change.

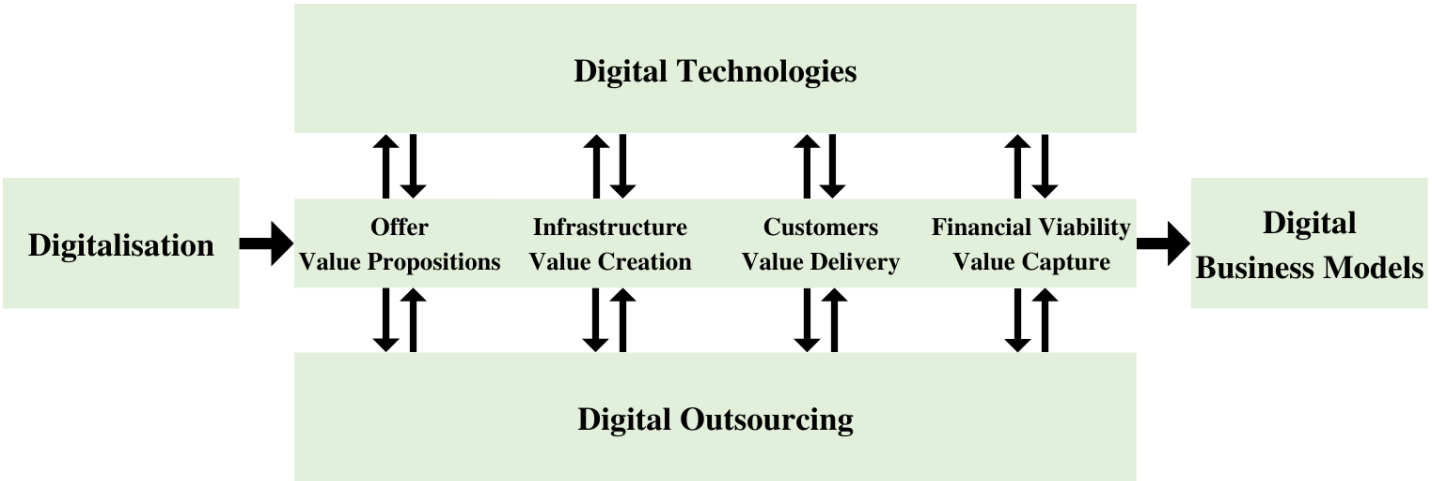

Figure 1. Theoretical Model

(Source: Our study)

3 Methodology

In the methodology chapter, techniques, approaches, and methods to collect, analyse, and interpret data are identified and justified. It also includes arguments for the chosen methods. The section identifies the research strategies, research design, literature selection, sampling, data collection and data analysis procedures, the study's reliability and validity, ethical considerations, and finally, limitations of the study.

3.1 Research Strategies

According to Bryman and Bell (2017), there are two distinct methods for conducting research: qualitative and quantitative. The qualitative approaches focus on collecting non-numeric data, while the quantitative method enables researchers to collect and analyse numeric/statistical data (Walliman, 2010). In addition to the two methods, Williams (2007) identified mixed methods, which involve combining both numeric and non-numeric data within a single study. This study adopted a qualitative method of data collection to enable an in-depth analysis of the impact of digitalisation on how start-ups develop their value propositions and business models to create, deliver and capture value. The qualitative method used in this study was a multiple case study.

The study opted for interviews as the most suitable data collection tool. The interviews conducted in this study were semi-structured. According to Jamshed (2014), semi-structured interviews are a qualitative form of interviewing that combines structured and semi-structured interviews to collect data. The researchers interviewed start-ups' that have been operating for a maximum of ten years from the point of registration and operating in six sectors: E-commerce, MedTech, Business coaching, Sustainable travel, Water and energy, and Video technology with AI and transcription. The researchers asked the respondents about their experience developing value propositions and business models using digitalisation. Consistent with the observation by Wan (2022), a semi-structured approach was suitable for the current study because it allowed the interviews to be structured flexibly, allowing respondents to emphasise their individual experiences.

The research approach combines inductive and deductive methods (Alvesson & Sköldberg, 2017). Inductive reasoning aims to develop a theory by making specific observations,

recognising patterns, and making general conclusions. Deductive reasoning aims to test existing theories by formulating hypotheses and collecting and analysing data to test the hypotheses. The hypotheses are rejected or confirmed based on theory propositions (Bryman & Bell, 2017). Research positioning can interpret deductive tendencies, which is that start-ups' should be able to benefit from digitalisation when developing their business models. The inductive approach correlates with how research seeks to answer the research questions on how startups can use digital solutions to overcome common barriers in the startup process.

Furthermore, this research has an abductive approach, meaning that research and theoretical perspectives have emerged from a review of the relevant literature (Azungah, 2018). As the researchers chose the abductive method, it allowed for further development of theoretical positions during the research (Alvesson & Sköldberg, 2017). Moreover, inductive reasoning is more suitable for qualitative studies. Given that the current study was qualitative, an abductive approach made the most sense as a research strategy.

3.2 Research design

The study is a multiple-case study design, which extensively explores bounded cases. It helps create an in-depth understanding of two or more cases and can also be used to investigate the cases in comparison (Bryman & Bell, 2017). It can be with a process, a business, or a situation. Moreover, the study intended to explore how digitalisation affects start-ups' business model changes extensively. Thus, it was necessary to develop an in-depth understanding of the situation and the meaning for those involved in start-up digital transformations. The case studies are exploratory, and according to Yin (2009), exploratory case studies involve the collection and analysis of more in-depth data about what is occurring concerning a situation.

The current study used several case studies, collecting data from multiple industries to identify similarities and differences in adopting digital technologies and how they influenced business model changes. The cases consist of start-ups from different industries and sectors. The researchers used the same method to investigate each case, as the study aimed to gain insights from both in-depth and comparable answers.

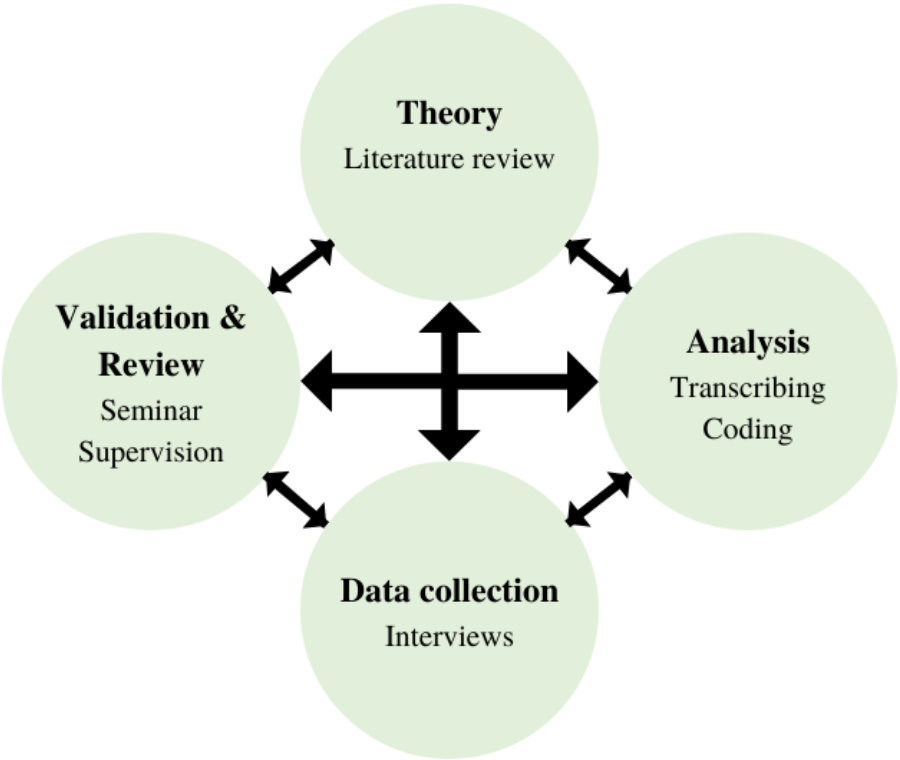

Figure 2. Research strategy and design

(Source: Our study)

3.3 Literature selection

A broad literature review, in the beginning, helped accumulate knowledge within the field of interest and find an appropriate research question. By combining the reading of previous literature with a critical approach, while taking notes, it was possible to filter relevant information and get inducted with the subject. Literature analysis led to questions of interest related to fields of limited research and knowledge (Bryman & Bell, 2017). The literature review of leading journals gave insights into trending topics and displayed which researchers and professors recurred in the most cited articles. It helped create a base of keywords and key persons to narrow the search according to criteria. Moreover, it helped find more relevant information from different databases (Bryman & Bell, 2017). Some of the keywords used in the beginning were "digitalisation," "start-ups," "business models," and "entrepreneurship."

Articles beyond the websites of leading journals within entrepreneurship, Lusem library, Google scholar, and Scopus were valuable for the research. For the articles from Google scholar, it was extra important to check the background, author, type of site, and when it was last updated (Bryman & Bell, 2017). Additionally, to secure the relevance and credibility of

only peer-reviewed literature. Furthermore, as Bryman and Bell (2017) indicate, the literature review work to find areas to contribute to and detect unanswered questions. It is also an ongoing process to narrow down the research and go back and forward between reading and writing. The method further helped find more relevant keywords and arguments for the research topic and question, given the suggested implications on further research in the most cited and recent articles. Moreover, it contributed relevant literature to build the theories, write the background, and problem discussion.

3.4 Sampling

The sampling technique for this study was purposive sampling. Purposive sampling requires researchers to select participants based on their knowledge and experience of the investigating phenomenon (Bryman & Bell, 2017). When using the purposive sampling technique, the researcher must set criteria for the potential population members with the desired knowledge and experience. The criteria were to choose start-ups' with a maximum of ten years from the point of registration. They had to be new and active or had hired at least one employee and functioning as an independent unit. Additionally, the start-ups' had to be either impacted by or made some changes in their business models concerning digitalisation.

However, there are limitations in the selection and outcome. According to Bryman and Bell (2017), choosing a sample to represent a broader field cannot be entirely accurate and representative for all. A mutual industry for all start-ups had been preferable for this, eliminating other external impacts or independent variables affecting specific industries. Nevertheless, the risk is that a more generalised result would be impossible and limit potential effects and changes in the business model due to digitalisation, not applying to other industries.

The first option was to reach out to incubators such as VentureLab, Ideon, and Mindpark to find start-ups to interview. Using a website with a list of all the members of SISP (SISP, n.d.) made it possible to contact many Swedish incubators to find appropriate respondents. Additionally, it gave access to the start-ups they collaborated with directly. The goal was to reach the founder, chief executive officers, or those in leading positions with a clear overview of the start-up's business model, strategy, and value-related activities. For the study's credibility, it is vital to have respondents directly related to and responsible for the specific

study subjects. As the participants were chosen based on specific criteria and not randomly, purposive sampling was obtained (Bryman & Bell, 2017).

Furthermore, by contacting incubators, reaching out to contacts, and searching the internet to find appropriate start-ups within a variety of industries, the aim was to find respondents of diversity to get study results covering the broader context. The incubators were contacted via email and phone, while the start-ups' were just through email. Moreover, if the first option was not generating enough interviews, the second was to use a snowball selection, meaning that the first respondents could introduce and match their contacts of relevance, leading to more interviews for the study (Bryman & Bell, 2017). However, reaching out to an extensive sampling secured enough interviews with direct contact.

The interviews consist of six start-ups from the following sectors and industries; E-commerce, MedTech, Business coaching, Sustainable travel, Water and energy, and Video technology with AI and transcription. The various industries gave a broad insight into how digitalisation impacts different business models and laid the foundation for a more generalised result. Choosing six cases also falls between the most appropriate amount of four to ten when doing case studies to extract enough information but a manageable quantity (Eisenhardt, 1989).

Start-Up	**Industry**	**Digital**	**Founded**	**Respondent**
A	Coaching	Hybrid	2016	Founder
B	Cosmetica	E-commerce	2016	Co-Founder
C	Water, Energi	App & Digital Plattform	2021	Co-Founder
D	IT, Software	Digital Video, AI	2015	CSM
E	MedTech	Digital Product	2021	Co-Founder
F	Travel	Digital Platform	2019	Co-Founder

Table 1. Start-up information

3.5 Data collection

The interviews were semi-structured. Thus the guide included specific and open questions regarding the subjects. Unstructured interviews allowed respondents to talk freely about a topic, with the potential to follow up answers with emerging questions. The questions were not in a set predetermined order; new and follow-up questions evolved during the conversation (Bryman & Bell, 2017; Saunders, Lewis & Thornhill, 2019). However, for a proper analysis sampling, the respondents should answer questions concerning all subjects. The goal was to get answers related to the questions but as honest and unbiased as possible.

The interviews were conducted online with Microsoft Teams. Before the meeting, researchers informed respondents that the interview would take approximately 45-60 minutes. All interviews were recorded after the respondents' approval. Bryman and Bell (2017) highlight the importance of recording qualitative interviews, in particular for the need for presence and focus on the respondent while being able to transcribe the recording for more accurate analysis afterward. Details from the interview might otherwise be lost. It can also help secure the accuracy of the empirical data since quotes and specific interpretations can be sent to the respondent to check and verify the respondent's validation. Furthermore, to minimise the risk of potential problems with the interview, all technical parts were studied before, including the choice of environment for the minimal background noise and that one of the interviewees was ready to take notes if necessary. Besides using the integrated recording on Teams, adding phone recording reduced potential technological problems.

Additionally, to keep the spoken words and meanings from the respondents accurate, the interviews were performed in their native language. It meant that interviews were conducted in English and Swedish, reducing potential misinterpretations. However, language translation can lead to misconceptions. It can be due to a lack of appropriate contrary words between the languages and missing sociocultural values behind the words (Xian, 2008). Since the thesis is in English, Swedish interviews translate into English. All empirical data from the interviews was sent back to the respondents for examination and approval to minimise the risks of misinterpretation when translating.

The respondents were informed of their anonymity further to increase the chances of transparency from the respondents and accurately reflect the answers and reality (Bryman &

Bell, 2017). It was also important to avoid questions concerning sensitive information and to secure discretion if needed. Instead, the focus was on the subjects and questions relevant to the study. The perseverance of anonymity and exclusion of sensitive information was maintained by naming the start-ups' with A-F instead of their business name. Moreover, the researchers did not mention respondents by name, and all information, for example, financial contributors connected to a company, were excluded.

3.5.1 Background

The following questions were formulated and asked to understand better the start-up and the person interviewed. Moreover, the timeline contributed to a better structure in the interview, finding the milestones where more detailed questions could evolve regarding the potential impact of digitalisation and changes within their business models.

- Tell us a little about yourself and your role in the company.
- Briefly tell us about the company; what is the offering?
- Could you tell us about the entire journey from when the company registered to where it is today, focusing on the milestones during that journey? Preferably as detailed as possible.

3.5.2 The impact of Digitalisation and Business Model changes

Depending on how many participants explained in detail regarding follow-up questions during the timeline, researchers chose the questions from the interview guide to complete and elaborate answers and lacking areas concerning the business model and digitalisation. Depending on their answers, they elaborated on potential impacts, implementations, or changes regarding digitalisation. The third question about milestones typically gave answers beforehand to other questions. Open questions made it easier to cover all business model fields of their business more in-depth. Following questions aimed to extract information regarding the product or service and the customer or potential customer. They focused on the fundamental parts of the business and how they have been impacted or changed due to digitalisation.

- Has the product/service changed during that time?
- How has digitalisation affected that process for each change?

- What is the customer segment, and has this been the same since the start?
- How have customer relations developed during the journey?
- Is there anything that distinguishes the possibilities or challenges of digitalisation between you and the customer?
- Are there any occasions since the start where changes have been made in activities to strengthen the bond between product/service and customer?

With the following questions, the goal was to cover more about value creation, delivery, and capture. Moreover, to find potential digital impact and any changes about digitalisation concerning infrastructure and customers.

- Has digital platforms or other channels been vital, and how has it changed over time?
- How has digitalisation helped or hindered the ability to carry out these activities?
- How has cost and revenue structure looked over time compared to the milestones?
- Have you seen that digitalisation has brought about changes in the cost and revenue structure?
- Has the customers' willingness to pay changed?
- Have parts of the business model changed to benefit from digitalisation?

The last questions intended to cover all parts of the business model and potentially elaborate on missing details focusing on digital technology. Furthermore, how implementing these technologies has impacted or beneficially developed the business model.

- Did any opportunities/challenges with digital technology exist?
- In retrospect, are there any digital technologies you believe you should or should not have used earlier?
- Are there any areas where digital technology has been essential?

3.6 Data analysis

Possibilities and challenges can arise with semi-structured interviews, such as within a multiple case study. It can happen due to the large amount of data that usually follows, which has to be structured and analysed (Bryman & Bell, 2017). It is favourable to analyse the data from the empirical findings concerning case studies with the aid of within-case analysis. It is

a way of simplifying large amounts of data which can be especially hard to interpret with a research question not containing a specific answer (Eisenhardt, 1989), which was the case for this study. Qualitative data are typically close reflections of reality and thus contain a more comprehensive depth of information and potential interpretations than, for example, quantitative data (Saunders, Lewis & Thornhill, 2019). However, the within-case analysis aims to form an understanding of the cases individually, finding patterns that eventually can function to mix the cases for interpretation as cross-case patterns. The analysis was a coding process, meaning the empirical data is broken down and interpreted to find new connections and understanding (Bryman & Bell, 2017). All interviews were transcribed, then coded individually with the theoretical model and research problem, developed throughout the study as a continuous process. Lastly, all empirical findings are summarised in a table, preparing for analysis and cross-case pattern identifications.

A critical factor for using a structural and cross-case analysis is that biases can quickly emerge and create incorrect assumptions or beliefs for the researchers (Eisenhardt, 1989). Furthermore, as a theoretical structure for organising the four contexts or areas of the analysis, the theory from chapter two concerning the business model was helpful as a foundation in chapter five. Two areas can be analysed individually and together, searching for patterns and contrasts (Eisenhardt, 1989). Moreover, with the conduction of empirical data regarding the digitalisation impact and business model development, new theories emerged for analysing the material. The coding process also made it possible to categorise valuable concepts based on their relevance and frequency, to determine new relevant theories, and to exclude prior ones without value (Bryman & Bell, 2017). Additionally, all four areas in the business model (offer/value propositions, infrastructure/value creation, customers/value delivery, and financial viability/value capture) could be analysed more in detail to theory and each other.

3.7 Reliability and validity

Determining the quality of study research include two critical criteria: validity and reliability. Bryman and Bell (2017) argue that while reliability and validity are more relevant to quantitative research, they can be applied to qualitative research to assess its quality. External reliability refers to the replicability of a research instrument, which implies arriving at consistent findings when repeatedly administered. However, achieving replicability in studies

can be difficult, as it is impossible to perfectly reproduce specific conditions or events (LeCompte & Goetz, 1982). To maintain high external reliability, this study aimed to present the complete research process, from start to finish, from reviewing the literature to selecting the participants and analysing the results. Therefore, complete comprehensibility and transparency of the methodology allowed future studies to replicate the process. However, due to the nature of qualitative research, it is difficult, or impossible, to reproduce the same results.

Internal reliability refers to whether research groups similarly interpreted results and got the same findings (Bryman & Bell, 2017). By transcribing the interviews, it was possible to maintain high internal reliability so that the research group could retrospectively review the data and draw unanimous conclusions. Additionally, during most of the research process, the group met physically and discussed issues to maintain consensus on an ongoing basis.

External validity refers to the degree of applicability of conclusions and results in the real world (Bryman & Bell, 2017). High external validity can be difficult to sustain due to study sample sizes, time frames, and the fact that cases are distinctive (LeCompte & Goetz, 1982). On the other hand, the type and depth of interviews aim to increase external validity. Bryman and Bell (2017) explain that internal validity indicates the degree of relationship between results and a theory or concept. This study aims to maintain high internal validity as the theoretical underpinnings form the basis of the results, and the results are compared and analysed with previous findings. During transcription, the researchers transcribed the dataset verbatim (word-by-word) to minimise the likelihood of making mistakes. Each question was read reiteratively and related to the transcribed data to ensure their relevance.

3.8 Ethical considerations

According to Bryman and Bell (2017), to pursue research ethically, there are four factors to consider. The four factors include: (i) Will there be any harm to the participants? (ii) Are there any flaws in informed consent? (iii) Will there be any invasion of privacy? (iv) Is imposture involved?

(i) Due to the participants' anonymity, the respondents' statements could not be connected to either the company or the individual. Therefore, the respondents did not risk leaking valuable or secret company information.

(ii) The purpose and the terms of the interview were described during the first contact with the respondents and again at the beginning of the interview. The respondents gave a verbal agreement to record the conversations and that the answers could be used in the research paper. However, the researcher did not present the purpose of the study to eliminate any potential affection of the respondents' answers.

(iii) All respondents were aware of the purpose of the interviewees and that the responses to the questions posed would be included in the report if relevant to the purpose of the research. The recording from the interview is not visible to anyone outside the thesis group and is deleted after the paper is graded. Before the interview, the two members - with only access to all information - of the thesis group were introduced to the participants.

(iv) Researchers listened to the recordings thoroughly to ensure that the participant's responses were interpreted correctly. The quotes were taken word for word directly from the recording. As noted in confirmability, the transcripts were first tracked individually and jointly to prevent subjective interpretation of the statements and mistakes.

3.9 Limitations

The study recruited six interviewees from different industries. Although the small sample size is enough for the qualitative study, relying on a small sample size limits the generalisability of the findings beyond the contexts from which the participants were fetched. Moreover, the participant from company D was not a key person, but he had good insight. Apart from needing more time to provide comprehensive information, some wanted to avoid disclosing certain types of information because they considered it confidential. Nevertheless, the researchers assured them of the study’s ethical compliance and managed to collect adequate qualitative data for analysis.

4 Empirical findings

The chapter contains the empirical findings from the six cases, A-F, and are presented individually. For each case, a background context explains the industry the start-up operates in, with some basic information and which role the respondent had in the company. Lastly, it follows the responses of how digitalisation has impacted different parts of their business model. Moreover, if any changes in the business model concerning digitalisation have happened and the effects of it.

4.1 Company A

4.1.1 Background

This company did not start digitally and used a traditional analog business model. The company's focus is on change management toward sustainable future workplaces. The person interviewed is the founder and owner of the company. She is a senior advisor to internal change leaders and project groups and a leading developer, lecturer, trainer, and coach of change management and sustainable leadership.

4.1.2 Impact of Digitalisation and Business Model changes

The company has become a joint stock company. Before that, it was a sole proprietorship. The years between a sole proprietorship and a joint stock company were utterly analogous. All meetings regarding coaching and change leadership took place physically on-site. In the years before the pandemic, companies started talking about flexible workplaces and working from home. Still, managers were sceptical about how this would happen, how they could keep track of their employees, etcetera.

> "So, you start talking about this with having flexible workplaces where you didn't know, like, if people were on-site or if they were somewhere else or something. Above all, managers were apprehensive and skeptical about that."

However, Company A set the pace for digitalisation by introducing online coaching. It was about letting the managers in, teaching them to let go of their need for control, and

understanding that they have to trust their employees and that they will do their work regardless of whether the manager was there.

Since her company was utterly analog, turning around and becoming digital was difficult. At first, she did not see her clients only accept online coaching or online change meetings. However, when the pandemic started, everything changed for her company, introducing a new way of thinking and working, for example, the digital program Zoom for online meetings. When the pandemic started, the work was about becoming digital, finding new ways to communicate with customers, and doing the job differently. She had sat in real-time training with Zoom and learned from other leaders, and for not being technical, she learned pretty quickly and got help from others who were also learning simultaneously.

> "So then I got to learn in real-time and sit with leaders who also learned in real-time. So this was very interesting from that perspective. That we learned together like all the time in some way."

At this stage, everything was now digital. All meetings were 100% digital, and she made sure to use a good platform, audio, internet, and camera. Thus the online meetings could be smooth, and the client got what they were looking for without any problems.

> "It turned out that because the pandemic was in place all the time, it became a one hundred percent digital assignment so that it was 100%, or should I say 90% remote change management by employees who were also remote."

The customer segment consists of large and small companies, aiming at the managers of those companies. The work involves change management toward a sustainable workplace. However, there are no specific industries she works with, but with companies that feel they need her help with a sustainable way of managing employees.

The usage of LinkedIn before the pandemic made it possible to target a customer segment. It was an excellent way to contact companies and employees. However, the use increased during and after the pandemic, even growing the interest geographically.

> “In terms of customer segment, it is probably the same, but I would definitely say that it has increased geographically.”

A website is under development. It should contain a new concept based on training for customers about all prior and current content. She wants to build a brand for herself and share knowledge. The training will be both digital and physical on-site.

> “There, I also think that I should be able to clone myself, so to speak. And there should be a bit more passive income in matching marketing campaigns around purely digital education, but almost self-managed. So it's a little about building a brand connected to you and still a little independent.”

The company's costs did not increase when going digital. On the contrary, digitalisation lowered costs. Travel costs were no longer there as all meetings took place online. The only costs were one-time costs for various digital platforms and the equipment for the online sessions. As all meetings took place online, she could have several assignments at the same time, which led to an increase in income and a very positive effect.

> “I would say that it has positively affected my income stream. I think that has to do with the fact that I could have, for example, two parallel long-term assignments instead of one.”

4.2 Company B

4.2.1 Background

The start-up is an e-commerce business offering “worry-free” sunscreen and cosmetics. They have created products with entirely natural ingredients and a high degree of organic ingredients that sells globally. Moreover, the person interviewed is a co-founder of the business.

4.2.2 Impact of Digitalisation and Business Model changes

From the beginning, the products have reflected the natural, organic, and sustainable vision. Consumers should know that they get products that are not harmful to them or the environment. Improvements have happened continuously since the start. For example, the

sugar cane tubes and direct product printing were impossible because of a minimum order quantity. Therefore, in the beginning, they needed to use plastic pump bottles, aluminum tins, and paper labels. Nevertheless, this changed as soon as they reached the minimum requirement and made it possible to upgrade the product.

Company B has transformed its sales channels over time. From the beginning, the most significant focus was on business-to-business segment. Still, at the moment, it is a more substantial focus on business-to-consumer, upgrading and expanding the reach via the website. Digitalisation created a more prominent need directly to the consumer; thus, most marketing and sales have been online to develop that direction further. Moreover, it produced better customer relations, products, and ways to connect. Regarding digital technologies, automated emails have improved the customer experience.

> "Digitalisation has helped us to establish a better relationship with our customers and stay in touch with them. For example, we try to interact with our audience via social media and stay in touch by sending out regular newsletters."

The biggest challenge was maintaining our website as an effective digital platform. Instagram has been a valuable tool in marketing, and the strategy has changed. Additionally, financial and human resources (educating the team) have been essential to use Instagram and other digital platforms efficiently.

> "Using digital platforms is essential for us, also since we all work remotely. Our use of digital platforms has stayed the same over time. We started using digital platforms from the beginning."

The cost structure has been about the same today as, from the beginning, sales follow variable costs. Revenue has increased over time; however, some setbacks concerning the pandemic of Covid-19 and the recent turbulence in Europe. The revenue increased when reaching a milestone, most notably during a new product launch.

> "Digitalisation has improved our revenue since we got new customers and additional sales through our newsletter campaigns and social media activities."

4.3 Company C

4.3.1 Background

One of the co-founders worked as a pipelayer, project manager, and calculator today in plumbing, while the other person worked with connecting products at larger companies. It laid the foundation for the idea and business, how to connect to the control system for heating and water systems in the property to collect and examine data. The person interviewed was one of the co-founders of the start-up.

4.3.2 Impact of Digitalisation and Business Model changes

The company has developed a system that identifies leaks and sends information directly to a plumber who can fix the problem when the alarm goes off. An intelligent system tracks customer substations and understands customer water usage, allowing customers to save money by optimising their use. Data values displaying in real-time via the internet and phone.

The part about identifying leaks as an add-on to the first product and service evolved later. They saw a need when finding a company that did a similar service and the potential to add value to the existing service. Moreover, they could use data to identify leaks concerning the basic service since already being connected to the control system.

To succeed, they needed to find a gateway. It had to have specific requirements for its functionality and be within the proper price range, as there were no external investors. However, they found a gateway within the criteria and were able to start developing the product and service to fulfil the identified need.

To proceed with the concept, they decided to do market research and talk to the end customers directly. As one of the co-founders had contacts within condominium associations, he arranged a meeting where they would present the idea. It was essential to give the picture with all the details. However, many questions arose regarding missing details and improvement areas.

Recently, they have noticed that it is easier to communicate when young people are on board. They are typically more familiar with and have an open mind regarding new technology, compared to older people who can be a bit more sceptical.

> "What was positive was that there was very mixed in the association, both older and younger members of the board."

Since the start, the customer segment has been condominium associations. It is a segment that gets less attention. Also, all major companies or property owners already work with major players, so they saw value in focusing on customer segments with less competition.
The challenge was identifying properties to contact, as there was still a need for a finished product. However, they had contact with some associations willing to be part of the product's test phase before the launch.

The plan was first to bring in external investors. However, the product still needed to be fully developed. Instead of giving up a large percentage of company shares required for the risk with an undeveloped and untested product, they used internal capital. The idea of a revenue model for the product is with a subscription. First, the customer pays an installation cost and then a monthly cost without any commitment period.

4.4 Company D

4.4.1 Background

The company focuses on video technology with customised products, including live streaming and video platform solutions. It is entirely digital and has been since the start. A new field, automated transcription, has recently been added to the business model. Furthermore, the person interviewed had the role of customer success manager. The position also integrates product development and overall knowledge of the company's business model.

4.4.2 Impact of Digitalisation and Business Model changes

The automated transcription started developing when identifying existing customers' needs, introduced in 2020. The development added value to the business model by focusing on online video, widening the offering, and solving a need.

> "We used Amberscript in the beginning. But we realised that if we can develop and solve this ourselves, it will be more economical. Moreover, it is possible to do something with it, create it and find new solutions because we saw the need."

AI, in general, is constantly developing and contributing to a better product as well as there are more functions regarding automated transcription to be implemented. Implementing AI also allows growth in different areas beyond the transcription platform and widens the offering.

Since the only owned product consists of the latest development, the AI platform for video transcription, the rest of the offering creates complete flexibility for the company. It is possible to create value by not being locked to one specific product or service and can compete by gathering the best parts from different partners and substitutes. However, it can also be a challenge not owning the products direct since it is harder to impact the pricing fully, as the pricing has to adapt after the suppliers.

> "As there are many different video platforms, by not owning any platform directly and instead having several other partners to resell the platforms, we can combine, customise, and program solutions depending on each platform's capabilities."

Additionally, it is similar to the transcription product. Even if the company owns the platform, the AI system used is from another provider (Speechmatics). It also adds to the flexibility by not being locked up to one provider, allowing switching to the one adding the most value.

> “It is also a risk to be a product owner because it costs much money to develop, and you get stuck in your solution. Then you cannot use someone else's solution.”

The customer segment primarily consists of municipalities and regions that need the service because of legal requirements, creating both a potential and a challenge. It is a potential regarding the legal condition meaning there is a strong need. Still, at the same time, it can be challenging due to the reluctance to change and innovation in governmental organisations. However, because of the legal requirements, everyone must adapt to them sooner or later.

Reaching out to customers, especially when not already having a broad network, for example, Google and LinkedIn, have been valuable digital tools. LinkedIn is more practical for reaching out to the private sector customer segment than a municipal employee. However, combining it with Google and finding potential candidates or customers to contact is still possible.

> “Before, I manually used Google to find municipalities and managed to see if they were already using a competitor's platform. I did this by looking at their live stream.”

The research method increases the odds of reaching out to the most potential customers and being more efficient. Additionally, a software called HubSpot helped keep track of every e-mail, using their basic service free of charge.

Another digital tool used earlier as a bridge with the customers was building a website. A program called Webflow, along with instructions from the site itself and YouTube helped build the site. The site has added to digital marketing, which in turn helped gain more customers.

To keep costs down concerning, for example, app development and accounting, outsourcing the services are standard. It is cheaper since the company does not have to hire directly. Instead, it becomes possible to hire temporarily per assignment.

For agreements and payments with customers, Qwilr as a digital system has been used and is beneficial. An agreement written by a lawyer is used as a template customised for the specific customer, handled digitally with bank identification signing.

To keep track of costs and salaries, the company uses Visma and Fortnox, with an outsourced accountant handling everything that is not already automated. It keeps the costs down since the company has not hired anyone for accounting.

4.5 Company E

4.5.1 Background

The company is a start-up within the MedTech industry, combining technology with healthcare. From the start of the business until today, three phases exist: value discovery and creation, building a product while piloting (prototype), and fundraising. The person interviewed is the CEO and one of the co-founders.

4.5.2 Impact of Digitalisation and Business Model changes

The prototype, and digital product first evolved from a prior product, seeing a need and value to develop it further for other companies. In the first phase, a Figma diagram, a type of prototyping tool, was used.

> "It is a way of prototyping your product without actually building it, very lightweight."

The prototyping evolved with pilot companies, which managed to create the product with minimum investment in stages and customise it according to the specific criteria and needs. A part of the process and solution was a type of e-learning referred to as a shareable content object reference model (SCORM). It makes it possible to take a static object like a PowerPoint slideshow (PPT) or video and make it trackable and measurable. Adding this to the prototype was one of a few very beneficial aspects the pilot companies contributed to and changed the direction.

> “If you cannot find paying customers, find pilot customers at the beginning so that they can give you opinions, and you are not just building this thing blindfold. It is really important.”

Miro's digital technology was an essential part of the prototype development. It helped create a clickable prototype, something the pilot companies could better interact with. It added enough value to get them on board and cooperating, joining the pilot.

> “Discovering Miro and learning about it allowed us to create a prototype that was good enough for the pilot companies to agree to join the pilot. That is probably the single biggest impact on our company.”

Outsourcing a small part of the software development led to timesaving and getting specific competencies for the criteria needed. However, since building the platform with Microsoft Azure and the outsourcing company was working in Amazon Web Service (AWS), it led to a somewhat divided product to merge.

> “The likelihood of you being able to build this entire product for yourself is low. You will always need other competencies.”

Additionally, developing these products typically requires different programming languages. It can be better to outsource these parts instead of learning those new languages. It saves time, minimises risks, and is a lot more effective.

From the beginning until now, the customer segment has been the same. However, customer knowledge has evolved, making it possible to better identify the correct customer depending on their stage or life cycle. It is important because the customer has to be in a specific setting to pay more attention in the future. Nevertheless, later on, it is possible to attract more customers with more experience, branding, and reputation.

> “The biggest research tool you can use to find a customer apart from their website … is LinkedIn. We use something called a LinkedIn sales navigator … to basically allow us an extra layer of visibility on the companies we are looking at.”

After identifying the customers, a valuable tool to structure and label them is a digital technology called HubSpot. With HubSpot, the targeted customers can be filtered with the collected information and then used via e-mail to contact them. Then, move back to LinkedIn and build relations with the company and individuals working there as a form of future investment. Additionally, Adobe suite complements the marketing activities for creating videos, designs, and illustrations for the website.

Furthermore, as a valuable digital tool for structuring the business, Google drive is functional. Something that can be used for documenting processes and activities, significantly impacting the company. Moreover, Dropbox is used to reflect the company publicly, including essential documents an investor might need to form potential investing decisions about the company.
The company used the Lean method, meaning all costs were minimum, creating a product without unnecessary additives.

> “The second phase was to build a product in the simplest, most cost-effective, and time-effective way that we possibly could.”

An excellent example of effectively capturing value was when creating the prototype with Miro. It successfully used digital technology to enhance their initial its offering, or replication of it.

> “I think that's the very definition of a lean kind of software product. It is a clickable prototype that does not need programming but gives you the experience of clicking through software and feeling the environment a little bit. So that is basically as close as you could get, basically for no cost.”

4.6 Company F

4.6.1 Background

The start-up is fully digital, and its product and service (a platform) are related to the transportation or travel industry, aiming to make it more sustainable. The person interviewed is one of the co-founders.

4.6.2 Impact of Digitalisation and Business Model changes

Initially, the product idea was more of a comparison service, making it easier for travelers to find more sustainable ways of traveling and rewarding the customers for doing this. However, several companies had already started in the field, creating more competition. Thus, it was possible to identify a less exploited customer need regarding business trips and a business-to-business model instead of focusing on business-to-consumer. The goal was to create a product that could impact how businesses and people travel more sustainably and entertainingly. With the platform, customers should have one solution to fulfill all their travel needs at a reasonable cost and in the most sustainable way, adding value to both the customers and the environment.

By conducting marketing research, it showed that these types of tools did not exist. Booking services mainly focused on selling trips, but no real focus on sustainability. Products existed to visualise and show climate impact. Something needed to be more proactive to improve it.
In a slow-moving industry, it took much work to find valuable cooperation with the existing content providers or those arranging the travel, such as travel agencies. New methods had to be adapted to find a new path outside the old systems of selling travel and without hiring.

> "How can we sell tickets … without hiring ten people with specific knowledge and a lot of tired systems where you are supposed to sit and tap in a terminal window."

They were moving on to the next part of the solution while adding a new pilot and more users for testing. Much work had to be done concerning the software, less with the hardware. However, a partner eventually helped the business immensely regarding that part. With the software, an outsourced team further contributed to the development of the service, leading up

to a beta version to test out when the technical parts were ready. The beta version could then be actively tested with a case and active user, leading to feedback to improve the product.

Another part that has impacted digitalisation, in general, is Covid-19, which has made people realise that, for example, meetings can be more efficient digitally. It likely adds value to these types of products and services.

> "I think for us, it is only positive from the point of view that it makes it easier for companies to opt out of traditional travel agencies to buy the type of tools we offer. The trends are that people want self-helping tools and do everything themself."

Even if the industry is or at least has been relatively slow, these technologies are evolving fast. In retrospect, some of the technologies in the development sector that the company created a couple of years ago are already legacy and outdated.

> "You also realise that you need a high degree of flexibility on your own regarding what platforms you choose to support and how you start building those things."

Additionally, it would have been better to have used a more automated pipeline to develop and deliver updates in production. Moreover, integrating complete services for the products to operate on instead of just the service managing that space.

> "We do unnecessary maintenance on a computer server today that we could buy from someone else if we had stopped and built the infrastructure a little differently."

Furthermore, some valuable tools for the company during the development, besides the outsourcing team's help, have been through the large cloud providers. The three biggest ones to mention are AWS, Google Cloud, and Azure from Microsoft. However, navigating these platforms and finding the most valuable parts can be challenging and take time and effort.

The business intended to be able to sell tickets on the platform as a complement rather than as primary income. It made it easier since the best environmental option was that travelers do not travel at all. Furthermore, obtaining a contribution in the preliminary stage helped engage in a pilot study, leading to another contribution. After those rounds, more capital entered the company from external investors.

After working with the pilots and users, it was possible to identify both a clear need and a will to pay for the product, making it possible just recently to add another round of investment capital to the business. The goal is to have a minimal viable product (MVP) ready for returning paying customers during the spring of 2023, focusing more on obtaining income for the platform use than the actual ticket sales.

> "We do not want to be dependent on the ticket sales… therefore selling them for the cost price and instead taking out a license fee for using the platform perusers. Not being dependent on the actual transaction that we are trying to reduce."

4.7 Summary

The following table presents an overview of the empirical data from the interviews. The left column shows the start-ups and their industry. The middle column summarises the general background concerning operations and the respondents' position. The right column describes the most significant impacts and changes in the business model due to digitalisation.

Start-Up	**Background**	**Impact of Digitalisation and Business Model changes**
A - Coaching	Fully analog before COVID-19, 100% digital during it, and hybrid after. Respondent has no employees. A senior advisor within change management.	Digitalisation impacted and transformed the business model from analog to digital. Changed the structure and acceptance of digital technology for the business and industry. Implemented digital tools like Zoom and LinkedIn. Managed to increase reach and lower cost with raised efficiency.
B - Cosmetica	Digital since the start with e-commerce products. Selling natural	Digital technologies has helped improve products, reach, and customer communication. Developing their website,

	products that benefit both people and the environment.	digital platforms, and social media like Instagram added value. Digital marketing helped grow the business.
C - Water, Energi	Digital system (software) connected to hardware, identifying water leaks and measuring energy use. Platform and app.	Digitalisation created opportunities to expand the original business idea as a digital additive. They identified differences in customer segments concerning digital technologies due to younger and older generations.
D - IT, Software	Digital video technology with AI and transcription. Fully digital. No direct ownership of service/products except for the transcription product.	It expanded products and services with digital technology, adding self-improving AI to the original offer. Used many digital platforms and tools for communication, customer targeting, and organising; LinkedIn, Google, Hubspot, Webflow, Youtube etcetera. Combined several digital platforms for a packaged offering with the best parts, creating efficiency and quality. Plus outsourcing.
E - MedTech	Creating a digital product. Combining technology and healthcare, makes technology easier and more efficient in the healthcare sector.	Implemented many digital technologies and improved the business model since the start. A better digital prototype with Miro from first using a Figma diagram with added tracking and measuring through SCORM. LinkedIn and cloud platforms (Azure and AWS) were critical digital platforms. Digital outsourcing for cost and knowledge optimisation. Digital tools like Google Drive and Hubspot for structure. Dropbox for investor transparency.
F - Travel	Fully digital. Creating a platform related to the travel industry. The goal is to make it more sustainable.	Digitalisation opened the possibility to change the market, focusing on the usage of the digital platform with license fees instead of ticket transactions. Changed from B2C to B2B, identified less competition with digital marketing research. Implemented digital outsourcing for programming and cloud platforms. Partnering with pilot companies, testing, and retesting for a MVP.

Table 2. Case study summary by start-up: Context, the impact of Digitalisation and Business Model changes

5 Analysis

In this chapter, the analysis of all areas in the business model is presented concerning the impact of digitalisation on the offer, infrastructure, customers, and financial viability. Moreover, how digitalisation can be used to enhance and develop the business model for each area. Finally, a revised theoretical model from chapter two is presented at the end.

5.1 Impacts and changes on the offer due to digitalisation

Digitalisation enabled innovation as a tool for start-up E, making it possible to combine digital technology with healthcare. The combination of digital artifacts for the company's platform and product to create value aligns with how Nambisan (2017) describes how entrepreneurs create opportunities in the healthcare sector by merging big data, data analytics, and IoT. An important part of their progress was using other digital technologies, like adding e-learning with a shareable content reference model (SCORM). To make the prototype trackable and measurable. Additionally also with Miro, which helped develop a better prototype from the original one created with a Figma diagram. It did not need programming but gave users the experience of clicking through software and feeling the environment, eventually enabling initial companies to join the pilot. Thus, creating more value with a digital infrastructure representing a more realistic version of an object, a virtual prototype (Nambisan, 2019), and strengthening the value propositions (Osterwalder & Pigneur, 2010; Richardson, 2008).

Start-up F changed its initial value propositions concerning its digital platform, focusing on business-to-business instead of business-to-consumer, avoiding higher competition. They also entered an industry with slow progression and adaptability, needing more support for new digital technology and the transformation of old systems. The reluctance to change and implement new technologies is evident even where they are needed, and their benefits are already confirmed (Akpan, Soopramanien & Kwak, 2020; (Fitzgerald, Kruschwitz, Bonnet & Welch, 2013). Furthermore, start-up C used digitalisation as a value-enhancing tool in its product, creating a service for efficiency and optimisation with its digital technology, enabling customers to save energy and identify potential leaks faster. Identifying leaks was an add-on to the original product, thus, adding more value to the existing hardware in the control

system, just updating the software. Company C used digital technologies to increase value and efficiency. Ropposch, Stiegler and Gubik (2021) support the efficiency of using more digitalisation and digital technologies to reduce unnecessary resources. Both companies nourish the value propositions due to meeting the needs and solving customer problems (Osterwalder & Pigneur, 2010; Richardson, 2008).

Additionally, start-up D sees benefits in using digital technology by itself. Their AI product is constantly developing and improving, thus creating a product of higher quality with potential offerings and growth beyond the current transcription technology. The development links with how Aghion, Jones and Jones (2017) explain how AI can help create more ideas, leading to more innovation which benefits the production technology. When markets are changing fast due to a high degree of technology, increasing the digitalisation phase correlates with how Teece (2010) argues for the importance of innovative value propositions. Thus it impacts the offering in the business model and forces its development to stay ahead of the competition and meet new customer needs. Similarities exist in all three factors related to developing successful digital infrastructure; innovation, adoption, and scaling mechanism. New innovative products and services emerge automatically, evolving adaption via more resources and growing digital infrastructure with external leverage (Henfridsson & Bygstad, 2013). The strategic positioning concerning value propositions is increasing due to products and services with higher competitiveness and the ability to provide crucial customer value, solving new needs (Richardson, 2008), and adding complementaries with novelty (Amit & Zott, 2001).

Furthermore, start-up D improved flexibility by not owning any platform directly and partnering with several providers. The company is using digital technologies and reselling as a product bundling from other providers, combining the best parts to create higher quality products and services by itself, increasing its competitiveness. The company achieved flexibility by combining, customising, and programming solutions consistent with each specific customer's needs rather than being locked up to one provider. The ability to switch providers depending on quality and cost enabled it to add more value. It also avoids being locked into a product and service, meaning there is a potential to eliminate network shifting costs (Amit & Zott, 2001) when not dependent on only one provider. Additionally, it adds value to change and adapt rapidly due to different market conditions (Rosin et al. 2020). Flexibility correlates according to how (Osterwalder & Pigneur, 2010) describes the value

propositions as a collection of benefits via products and services. It reinforces the value propositions by offering its customers a package of the most appropriate and valuable offerings from several digital technology providers.

During the pandemic, start-up A managed to increase its efficiency with digital technology due to implementing two parallel programs instead of just one at a time. It is an example of how digitalisation supported new ways of working efficiently during the COVID-19 pandemic (Akpan, Soopramanien & Kwak, 2020; Bolisani et al. 2020; Lowenthal et al. 2020). Additionally, start-up F supports the effects of digitalisation due to the pandemic, positively increasing awareness of digital technologies and the efficiency of digital meetings. The company also adds that it increases the likelihood of choosing products and services like theirs and a rising trend with self-helping tools. Moreover, increasing digital awareness and digitalisation will likely benefit start-up D concerning its customer segment. Since their obligation to use transcripted material is due to a legal requirement. It should drive customers to the product and service due to an increase in need; thus, digital infrastructure is growing with the adoption mechanism (Henfridsson & Bygstad, 2013). It strengthens the value propositions since the customers are more likely to choose the product and service, providing increased value and creating competitiveness (Richardson, 2008).

5.2 Impacts and changes on the infrastructure due to digitalisation

The cloud platform AWS helped improve growth for start-up E by outsourcing one part of their product. In contrast, start-up F found all large providers (Google, Microsoft, and Amazon) helpful in combining the best parts. These external providers combine digital infrastructures and create practical tools for processing and analysing a large amount of data on their clouds (Berisha, Mëziu & Shabani, 2022). Additionally, the AI field is growing with cloud platforms where Google, Amazon, and Microsoft are taking the lead, using AI technology to help business growth (Kotas, Naughton & Imam, 2018; Mufti, Mittal & Gupta, 2020). Furthermore, start-up F found shareable digital infrastructure with a partner effective for increasing growth. By using these and other digital infrastructures, businesses and start-ups' are using a scaling mechanism in which shareability can positively impact growth (Henfridsson & Bygstad, 2013). They are adding to the fundamentals of key partners and resources to improve the business model through optimisation and economy of scale (Osterwalder & Pigneur, 2010).

The increased accessibility to external knowledge has been vital for start-ups E and F concerning product development. Theory shows the same opportunities with outsourcing, using external service providers with specialised knowledge regarding digital infrastructure, making it possible to enhance the internal business model (Bhimani & Willcocks, 2014; Mazumder & Garg, 2021). The outsourcing method is associated with Osterwalder and Pigneur (2010) regarding financial, intellectual, and human capital as key resources in the business model for it to function. However, since the outsourcing company used another programming language for company E, the product comprised two parts, with two types of languages merged. Parts of the product outsource to those with specialised knowledge of a specific system or digital infrastructure. Even if it was more beneficial to outsource the service, some challenges exist with completely matching outsourced tasks and services (Bhimani & Willcocks, 2014).

After the pandemic with COVID-19, start-up A explained that the radical change and transformation from analog to digital created a significant need to learn new methods of working and the function of digital technologies. Digitalisation created a digital transformation of the business model due to a significant impact, forcing development to stay valuable in the changing environment (Verhoef et al. 2021). The quality of digital technologies and tools for operating was also important for the company. The platform (Zoom), audio, internet, and camera had to function correctly and maintain a quality good enough to deliver a similar or better service than in person. It correlates with how changes are happening on a societal level regarding technology and information systems (Majchrzak, Markus & Wareham, 2016) while trying to improve the condition and service "*... through combinations of information, computing, communication, and connectivity technologies*" (Vial, 2019, p. 118). The key activities are developing new ways to deliver the value propositions to attain the changing market and preserve customer relationships while implementing varied physical key resources (Osterwalder & Pigneur, 2010).

Moreover, start-up A started educating managers concerning less control and more trust in their employees, which was necessary for the new digital environment. It was using and increasing intellectual and human resources with its customer (managers), reflecting how Osterwalder and Pigneur (2010) describe the use of key resources to preserve customer relationships and create and deliver value propositions. Additionally, start-up B saw the

team's education as one of the most significant factors in using digital platforms effectively, such as their website and Instagram. The changes for start-ups A and B, directly and indirectly, relate to how Bharadwaj et al. (2013) describe how digitalisation enhances the accessibility to information and knowledge to solve customers' needs and increase their perceived value. It supports value creation with significant external and internal stakeholders (Biloshapka & Osiyevksyy, 2018).

Furthermore, digital technologies are essential for creating value in the business model for start-up D. The company uses the program Webflow and YouTube guidelines to build a site that improves digital marketing and helps the company increase its market share. The company also uses Qwilr to make agreements with and payments to customers and Visma and Fortnox to keep track of costs and salaries. Youtube can help access crucial operation guidelines (Yang et al. 2020). Start-up E further uses Adobe suite to complement marketing activities, including creating videos, designs, and illustrations for the website. Additionally, the company uses the free service aspect of HubSpot to track and structure emails. Srinivasan and Venkatraman (2017) noted that entrepreneurs and start-ups use different digital platforms that suit their specific needs and requirements. Most platforms customise to the specific organisational needs businesses intend to achieve. Above digital technology adds to the improved information transactions due to digitalisation (Amit & Zott, 2001) and how value is created in business models (Richardson, 2008), enhancing key resources and activities (Osterwalder & Pigneur, 2010).

5.3 Impacts and changes with customers due to digitalisation

Start-up A experienced an immediate need to adopt the business from analog to digital when the restrictions due to COVID-19 occurred. It shifted the entire delivery system (Richardson, 2008), forcing the adaption of new digital technologies, which according to Teece (2010), is crucial for optimising the business model to capture long-term value. Company A's clients accepted Zoom as a channel for training and conducting leadership changes first when the pandemic hit. Past studies acknowledge that the COVID-19 pandemic forced companies to install digital platforms that provided channels for working away from the office to comply with physical movement restrictions and social distancing (Akpan, Soopramanien & Kwak, 2020; Bolisani et al. 2020; Herath and Herath, 2020). Notwithstanding the adoption hurdles, it compelled people to accept the new technologies and use platforms such as Zoom to

conduct activities online (Puddister & Small, 2020; Lowenthal et al. 2020). The pandemic increased the speed of digitalisation, which led to a growing need and acceptance of digital technology. It developed an adaptation for these products and services as an adoption mechanism of digital infrastructure (Henfridsson & Bygstad, 2013).

Moreover, start-up A exhibited greater flexibility because of the work-from-home mode of operation. However, it was evident that its customers (managers) needed to be more apprehensive about the flexible workplaces. Bolisani et al. (2020) expressed a similar concern and found that working from home was associated with several challenges, for example, the lack of an effective mechanism to track employees' work. Nevertheless, as evident in start-up F, a high degree of flexibility is necessary regarding the digital technologies and platforms to support operations and how to build the platforms. It also correlates with the innovation mechanism, where open and flexible atmospheres lead to new connections and enhanced development, combining internal and external resources (Henfridsson & Bygstad, 2013). Thus, changing their communication and distribution via new channels improved the delivery of value propositions (Osterwalder & Pigneur, 2010).

Despite the importance of adopting digitalisation as a business strategy, start-up D revealed that it is challenging for government organisations to adopt new technologies due to reluctance to change and innovation. Potential factors for resisting change can be due to lacking urgency for digital adaptation, and the current system and business model are experienced as functioning (Fitzgerald, Kruschwitz, Bonnet & Welch, 2013). Thus building personal customer relationships can be extra crucial for problem-solving and delivering value propositions the customers rely on (Osterwalder & Pigneur, 2010). Furthermore, it was evident for start-up C that it became easier to communicate when young people were on board concerning their customer segment. Existing literature, such as Berkup (2014), also revealed that young people's enthusiasm for technology enables companies to utilise technological platforms to improve business processes. Being enthusiastic about technology enables young people to achieve familiarity faster than older members of organisations. Thus it can be vital to find and filter the customer segment accordingly due to different behaviors and attributes (Osterwalder & Pigneur, 2010).

The importance of digital platforms is evident for start-ups A, B, D, and E. Social media platforms, particularly LinkedIn, helped start-ups A, D, and E to maintain contact with other

companies and clients while increasing their reach and finding more potential customers. For example, start-up D uses Google and LinkedIn to reach out to private sector customers and municipal employees, which helps filter and target specific segments. Start-up A explained that it eased contacting companies and employees while helping reach further internationally. Start-up D added that it is a vital element not already having a broad network of contacts. The prior theory supports that LinkedIn is a popular social media platform companies use to create connections with markets (Yang et al. 2020), with positive informational effects and networking on the platform (Banerji & Reimer, 2019; Utz & Breuer, 2019). Overall, reaching out and networking create key partnerships for obtaining resources while building relationships with customer acquisition and retention, helping deliver value propositions through the channel (Osterwalder & Pigneur, 2010).

Additionally, start-up E further expanded the use of the digital platform LinkedIn, implementing its digital technology LinkedIn sales navigator, enabling richer data about their targeted customer segments. The platform functioned as a tool for building relations as a future investment. Thus it benefited from the extraction of digital data that other users provided on the platform, exchanging value as a networking ecosystem (Alaimo, Kallinikos & Valderrama, 2019). Similarly, start-up B has continued to benefit significantly from digital platforms, like its own website and Instagram, which it uses to enhance and maintain customer relationships. The website as a digital platform and channel created a more significant need with more customers and sales, which grew further by applying more resources to the platform and developing the marketing. Relating to how Kallinikos, Aaltonen and Marton (2013) describe how digital artifacts make up the fundamental of websites, giving them a foundation that can easily be modified, developed, and improved. It meant they could upgrade their products, giving them better quality and representing the brand and underlying vision of being sustainable and organic. Thus, choosing the correct digital platforms and channels is essential for networking, value creation, and delivery for entrepreneurs in the early business stages (Srinivasan & Venkatraman, 2017). The channels help create a bridge to the company's value propositions (Osterwalder & Pigneur, 2010), enhancing the value delivery system and its strategic positioning (Richardson, 2008).

5.4 Impacts and changes on the financial viability due to digitalisation

The lean production method has been vital for start-up E in the digital environment, which is instrumental in keeping costs low and eliminating unnecessary additives. The company paid attention to adopting the simplest, most cost-effective, and time-effective methods to build a product. An example of this was their prototype that enabled value capture increases with minimal costs. It created a digital version of a physical thing that is more efficient, cost- and time-effective (Kent, Snider, Gopsill & Hicks, 2021). Additionally, start-up A experienced a decreased cost when implementing and adopting digital technologies. Digital technologies can enable increased information transactions while reducing the use of resources, which helps raise efficiency and minimise operating costs (Rosin et al. 2020). Adding to adequate infrastructure and financial viability (Osterwalder & Pigneur, 2010) delivered to the customer as an economic value delivery system (Biloshapka & Osiyevksyy, 2018).

Start-ups D and F use digital outsourcing to minimise the costs of processes such as app and platform development and accounting. App development with outsourced expertise can show benefits, which according to Jabangwe, Edison and Duc (2018), is essential to stay competitive due to the rapidly evolving field. Moreover, the examples correspond with the theory that digital outsourcing is increasing while providing more value to business models (Bhimani & Willcocks, 2014). Additionally, outsourcing is a more affordable option because the two companies only hire temporarily based on assignment needs instead of maintaining a full-time staff. Mazumder and Garg (2021) also support this and indicate that specialised competence and flexibility lower costs with digital technology as a vital driver. Additionally, boosting the cost structure, financial viability (Osterwalder & Pigneur, 2010), and the economic model with better margins lead to capturing more value (Richardson, 2008).

Furthermore, start-up A experienced a positive impact from digitalisation regarding the income stream. During and after COVID-19, it was possible to arrange assignments simultaneously, running them parallel, when eliminating the travel for meetings. The core of how the business operates and generates income is changing due to digital technologies, meaning the business model is becoming digital (Veit et al. 2014) from previously analog. They positively impacted the economic and revenue models by reducing costs, increasing revenues and profits, and capturing more value (Richardson, 2008). Contrary to start-up A, start-up B experienced a revenue setback due to the pandemic and the current turbulence in

Europe. However, it was digital from the beginning, and no specific changes concerning digitalisation happened. Instead, the respondent mentioned an overall improvement because of digitalisation, positively impacting the revenue stream since their newsletter campaign and social media activities brought in more sales via new customers. It correlates with the findings of Poddar and Agarwal (2019), which stress the benefits of digital and social media marketing for start-ups', raising the overall popularity of the product and service and increasing revenue. The same advantage exists with newsletter campaigns linked to automatisation, which according to Courchesne, Ravanas and Pulido (2019), is positively impacting revenue. It can ease the processes of identifying specific customer segments and finding how much they are willing to pay for the product or service while creating a linking revenue stream (Osterwalder & Pigneur, 2010).

Additionally, digitalisation has opened the possibility of creating alternative income, not binding the revenue stream to the product or service. For example, start-up F focuses on a digital platform selling travel tickets but intends to gain revenue on the actual use of the platform via a license fee instead of the transactions. The company adds value with novelty and complementaries (Amit & Zott, 2001). It shows the impact of digitalisation with new creative ways of fulfilling customer needs and expanding their experience, making it easier to merge internal and external digital business models (Bharadwaj et al. 2013), creating and capturing more value (Richardson, 2008).

5.5 Revised Theoretical Model

The revised theoretical model compromises additional enablers and obstacles for changing the speed of how *digitalisation* impacts start-ups' business models. What effects as opportunities and challenges occur in implementing *digital technologies* and *digital outsourcing* within each area of the business model; *offer/value propositions*, *infrastructure/value creation*, *customers/value delivery*, and *financial viability/value capture*. Additionally, how it develops the structure of the business model and becomes digital or further develops the already *digital business models*.

The theoretical model presents two significant variables based on the empirical findings and theory affecting the pace of digitalisation and, thus, impacting the start-ups' business models, such as *COVID-19* and *markets*. The former radically increased the speed of digitalisation,

forcing change and digital adoption of business models (Akpan, Soopramanien & Kwak, 2020; Bolisani et al. 2020; Herath & Herath, 2020; Start-up A, 2022; Start-up F, 2022). The latter indicates how it can accelerate and decelerate the momentum of digitalisation due to markets, thus, the impact of start-ups' business models. Start-up C mentions the older generation as a market decelerator, while the younger generation can be an accelerator. Additionally, start-up A added reluctance to digital change from managers before COVID-19 as a decelerator, and according to start-up F, the pure presence of technologies can be an accelerator.

Furthermore, summarised from the analysis above, the theoretical model presents the effects as opportunities and challenges identified from the analysis of the empirical findings and the theory. Digital technologies can improve *quality*, *efficiency*, and *growth* when implemented in the offer/value propositions. The infrastructure/value creation can be enhanced and improved with *growth* and *access,* while learning new digital technology can be a challenge but simultaneously an opportunity due to, for example, e-learning. Digital outsourcing can increase knowledge and further improve *growth*. Nevertheless, some challenges can exist in matching the internal product requirement with the service from the external providers. Digital technologies can access and strengthen *knowledge* and raise *flexibility* while improving customer *relations*. However, they also create *adoption challenges* for implementing them in the business model and to clients in the area of customers/value delivery in the business model. Lastly, digital technologies can boost financial viability/value capture for *reduced cost*, higher *income,* and enhanced effectiveness for reaching financial goals. Moreover, digital outsourcing can be added to this area to *reduce costs* further, raise *value* with specialised knowledge, and reduce the need for hiring.

Based on the empirical findings and the prior theoretical model (**Figure 1.**), the following revised theoretical model (**Figure 3.**) is presented below. The added boxes between "Digital Technologies" and the middle, which represent the four parts of the business model, respectively "Digital Outsourcing" and the middle, display the "Opportunities (+) and Challenges (-)," concerning business model development with digital implementation. These are the ones summarised above, from theory and empirical findings. Together with the impacts of digitalisation, they compel the formation or development of digital business models. Business models that are better coordinated for a digital transformation (Verhoef et

al. 2021) and changed by digital technologies (Veit et al. 2014), developing existing functions and how value is created and captured (Bharadwaj et al. 2013).

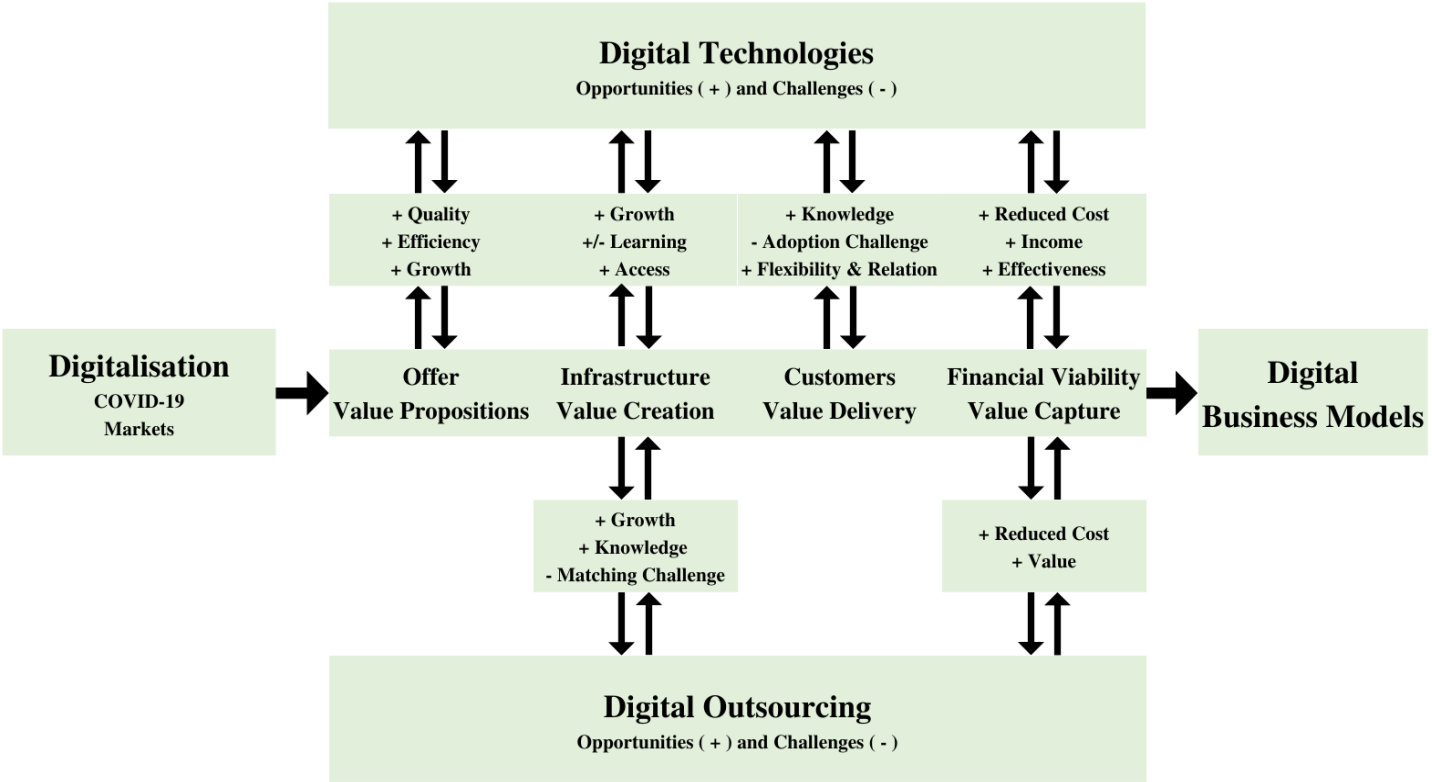

Figure 3. Revised Theoretical Model
(Source: Our study)

6 Conclusion & Discussion

The final chapter presents the conclusions based on the analysis. Next follow a general discussion concerning the study, accompanied by theoretical, entrepreneurial, and practical implications. Finally presenting suggestions for further research.

6.1 Conclusions

- *How is digitalisation impacting and developing start-ups' business models?*

The research supports previous theories concerning digitalisation's impact on start-ups' business models and external factors impacting the pace of digital change. Business models were significantly impacted during the pandemic of COVID-19, forcing radical changes and adaptations to cope with the transformed environment. It was especially evident with analog business models, directly changing its fundamentals. Nevertheless, digitalisation created greater flexibility and efficiency without adventuring the previous quality of the value propositions and delivery system. It was also notable that digitalisation impacts business models at different rates depending on the industry's market and primary customer segments. Some markets and customer segments are reluctant to digital change. In contrast, others are more open; therefore, digitalisation impacts the business models with divided force, depending on where and to whom the companies are or intend to provide their products and services. However, as most start-ups in the study were digital from the beginning, digitalisation did not impact them directly as an uncontrolled impact, forcing changes to their business models.

Digitalisation was a significant enabler for start-ups' business models and continuous development, with digital technologies and outsourcing as central drivers. In the early stages of many start-ups, they introduced digital platforms like LinkedIn that notably contributed to their success. Together with other digital platforms and social media, it helped develop and strengthen the bridge between the customers and their value propositions. Additionally, digital technologies can improve and develop value propositions with AI, digital prototyping,

data analytics, and product tracking, raising quality, efficiency and growth. It is advantageous for creating value while improving the business model infrastructure with access to more information and efficient systems as digital tools for finance, marketing, and structural organising. It leads to lower costs and higher income, enhancing the value capture. Digital technologies improve and develop all aspects of business models. However, some challenges exist in implementing, learning, and adapting to them, while choosing the right ones for the intended purpose is crucial.

Digital outsourcing and external providers are incredibly beneficial for start-ups to excel in growth with specialised knowledge, reinforcing and developing the infrastructure of the business models. They also favourably transform financial viability, reduce costs, and improve income and value. Digital outsourcing for programming and software development and with external providers from the cloud platforms AWS, Azure, and GCP showed remarkably useful in expanding the business model efficiently. Though some challenges can exist in matching products and services, digital outsourcing positively impacts and develops key resources and activities, creating a better offer with stronger value propositions.

6.2 Discussion

As the study's empirical findings consist of a purposive sampling with six start-ups' from different industries, it was possible to obtain an arguably generalised and nuanced result. However, it also had its limitations because the sampling was relatively small. Choosing only one industry might have limited potential findings in impacts and changes with the business model regarding digitalisation outside those boundaries. Arguably another factor impacting the findings could be that most start-ups were digital from the beginning. Even though digitalisation impacted all start-ups' somehow, the most significant impact was for the one analog from the beginning. Thus adding at least a few more start-ups to each industry and non-digital ones for comparison and evaluation would have been favourable. It could further strengthen the findings of some sporadic data from the coding process relating to each identified factor in the empirical summary. Nevertheless, it was possible to obtain an overall understanding and confirm valuable data with theory between different start-ups' and industries on most factors and opportunities or challenges arising due to digitalisation.

Furthermore, beyond functioning as a framework for analysing the empirical findings, the prior theories also helped create the interview guide. It functioned as a foundation for building the questions and determining which ones to include to cover all the business model's aspects. However, some limitations exist when choosing existing theories for constructing the interview guide. The Business Model Canvas (Osterwalder & Pigneur, 2010) inspired the fundamentals of the interview guide, strengthened with the Business Model Framework (Richardson, 2008), and with additional questions regarding digital technology. Since other theories on the business model exist, this can be a factor impacting the questions and responses. Additionally, the same interview guides (Swedish and English) were used in all interviews, keeping them consistent. However, using one interview guide and similar language for all interviews would be preferable, even if using precautions and sending the empirical data to each start-up's respondent for validation.

The prior theory and the empirical data support the study's relevance. It suggests the need for more research concerning digital entrepreneurship and technology (Rosin et al. 2020), between digitalisation and value propositions (Hervé, Schmitt & Baldegger, 2020), and digital technologies and business models (Ropposch, Stiegler & Gubik, 2021). Moreover, the combination of them. The empirical data added insights into how digitalisation can impact and beneficially develop start-ups' business models, value propositions, creation, delivery, and capture. Nevertheless, both theory and empirical data supported challenges regarding which digital technologies to choose and how to implement them. Thus, the study supports prior theories that more research is necessary while contributing to reflecting the value of doing it. Hopefully, the study can bring more insights into the relevance of further studies regarding digitalisation and start-ups' business models. Moreover, to keep up with the momentum of the fast-changing environment of digitalisation, digital technologies, and digital transformation.

Additionally, the findings concerning the empirical data clearly showed how start-ups' can benefit from digitalisation, improving the business model with digital technology and outsourcing. Digital platforms and social media can significantly improve the networking effects, and the efficiency of many business tasks while self-improving products due to AI and help reduce costs and risks. With the additional risks of newly established businesses and due to the statistics regarding their business model as a prominent factor for business failure, the field should find inspiration and value in how digitalisation can enhance it. Furthermore,

it can add value to innovation and development that could apply to more extensive cooperations or slow-moving industries reluctant to change and society as a whole.

6.3 Theoretical Implications

The study contributes to the current field of research for start-ups' business models in a digital era. It supports many of the previous findings regarding enablers for digitalisation, the transformation from analog to digital business models, digital entrepreneurship, and how start-ups can benefit from implementing digital technologies and digital outsourcing, as a few. Moreover, the study connects those areas and presents opportunities and challenges for start-ups concerning their business models and digitalisation.

Regarding the addressed need that the field needs a framework for how start-ups should integrate different digital technologies into their business model (Zaheer, Breyer & Dumay, 2019), the theoretical models (**Figure 1.**) and (**Figure 3.**) can be inspirational for further development. The former can function as a structural tool for organising more empirical findings of how and which digital technologies to implement in which area of the business model. The latter, complemented with the empirical findings, theory, and analysis, should utilise investigating how and which digital technologies are beneficial to implement in which part of the business model. Additionally, the models shall be used with precautions and considered inspirational guidelines before being retested. More samples and data are needed to verify and expand the findings.

6.4 Entrepreneurial and Practical Implications

Entrepreneurs and start-ups may express increased interest in exploring digitalisation's benefits to their business models. Findings from the study supported the positive instrumentality of digital technologies, digital outsourcing, and other digital implications for business model improvement. Thus, it should motivate start-ups to consider using digitalisation in their favour and implement digital leveraging. Different implications might be appropriate depending on their goals, product, and services. However, some adjustments to digitalisation are necessary, and some applications of digital products and services applications are most likely justified. Concerning start-ups facing a high degree of risk and many of their failures linked to a defective business model, entrepreneurs should consider all potential leverage for success and protection from failure.

Digital platforms are valuable tools for improving business models, and start-ups should consider using digital platforms such as LinkedIn for networking, building customer relations, and targeting customer segments. Instagram and automated newsletters for cost-effective digital marketing. Webflow is beneficial for effectively building a website and providing a valuable channel between the value propositions and customers, while Youtube can assist in creation. Adobe suite can complement website marketing for creative design.

Digital infrastructure, like digital prototyping, can be valuable when creating products using the lean method for keeping costs down. It can help the creation of realistic copies close to reality but with more flexibility and fewer costs. Helpful digital tools for that are the e-learning model SCORM for tracking and measuring with Miro, increasing its realistic features. Additionally, adding AI to products can help them self-improve and develop beyond their original capabilities. Start-ups should consider using Zoom for digital meetings and avoid unnecessary traveling. Qwilr is suitable for creating customer agreements, Visma and Fortnox help with financial structure, and Hubspot tracks and structures emails.

Digital outsourcing and external providers, such as via cloud platforms, can be worth implementing in the business model. The three larger platforms, AWS, Azure, and GCP, can help initiate growth and provide useful data analytics with big data and other valuable tools. Digital outsourcing provides specialised knowledge for a lower cost and higher efficiency, avoiding hiring and training employees for every task. Examples are for app and platform development, in other words, software programming. Additionally, start-ups should consider partnerships for additional scaling, which digitalisation makes access easier.

6.5 Suggestions for further research

The study examined the impact and changes within start-ups' business models due to digitalisation. Since most start-ups chosen for the study were digital from the beginning, future studies could focus on researching the same problem with more companies that have developed their business model from analog to digital. It will likely be of interest; hence digitalisation had the most considerable impact on the one being analog from the beginning. Additionally, a similar study could usefully examine mature businesses as a comparison. It will likely increase the odds of them being analog from the beginning, which could give a

richer picture of how digitalisation and what digital enablers impact the business model during digital transformations.

Future research may conduct a similar study on a larger scale, favourably extending the study to other industries and comparing digitalisation's impact from multiple viewpoints. The current study selected participants from six industries (coaching, cosmetics, water and energy, IT/software, medical technology, and travel). Given the variety of individual industries and the low sample size for each industry, the findings may not be more readily generalisable. Future studies should preferably extend the study, collecting empirical data from several start-ups within the same industries to validate the findings and generate data for informing policy and practice. Finally, quantitative research could be combined to complement the findings with statistical data and reduce potential limitations to strengthen the qualitative data.

References

Aghion, P., Jones, B.F., & Jones, C.I. (2017). Artificial Intelligence and Economic Growth, The Economics of Artificial Intelligence: An Agenda [pdf], pp.237-282, Available at:https://www.nber.org/system/files/chapters/c14015/c14015.pdf [Accessed 26 December 2022]

Akpan, I.J., Soopramanien, D., & Kwak, D-H. (2021). Cutting-edge technologies for small business and innovation in the era of COVID-19 global health pandemic, *Journal of Small Business & Entrepreneurship*, vol. 33, no. 6, pp.607-617, Available online: https://doi.org/10.1080/08276331.2020.1799294 [Accessed 08 January 2022]

Alaimo, C., Kallinikos, J., & Valderrama, E. (2020). Platforms as service ecosystems: Lessons from social media. *Journal of Information Technology*, vol. *35,* no. 1, pp.25-48, https://journals.sagepub.com/doi/full/10.1177/0268396219881462 [Accessed 19 December 2022]

Alvarez, S.A., & Barney, J.B. (2007). Discovery and Creation: Alternative Theories of Entrepreneurial Action, *Strategic Entrepreneurship Journal,* [e-journal] vol. 1, no. 1‑2, pp.11-26, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 20 November 2022]

Alvesson, M., & Skölberg, K. (2017). *Tolkning och Reflektion: Vetenskapsfilosofi och Kvalitativ Metod,* 3rd edn, Lund: Studentlitteratur

Amit, R., & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, vol. 22, no. 6/7, pp.493-520, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 22 December 2022]

Azungah, T. (2018). Qualitative research: deductive and inductive approaches to data analysis. *Qualitative research journal,* vol. 18 no. 4, pp. 383-400. Available online: https://www.emerald.com/insight/content/doi/10.1108/QRJ-D-18-00035/full/html [Accessed 3 January 2023]

Banerji, D., & Reimer, T. (2019). Startup founders and their LinkedIn connections: Are well-connected entrepreneurs more successful?, *Computers in Human Behavior*, vol. *90*, pp.46-52, Available online: https://www.sciencedirect.com/science/article/pii/S0747563218304084 [Accessed 19 December 2022]

Barney JB. (2002). *Gaining and Sustaining Competitive Advantage*. Addison-Wesley: Reading, MA.

Berisha, B., Mëziu, E., & Shabani, I. (2022). Big data analytics in Cloud computing: an overview, Journal of Cloud Computing, vol. 11, no. 24, Available online: https://journalofcloudcomputing.springeropen.com/articles/10.1186/s13677-022-00301-w [Accessed 21 December 2022]

Berkup, S.B. (2014). Working With Generations X And Y In Generation Z Period: Management Of Different Generations In Business Life, *Mediterranean Journal of Social Sciences*, vol. 5, no. 19, pp.218-229, Available online: https://www.richtmann.org/journal/index.php/mjss/article/view/4247 [Accessed 8 January 2023]

Berman, S.J. (2012). Digital transformation: opportunities to create new business models, *Strategy & Leadership*, [e-journal] vol. 40, no. 2, pp.16-24, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 27 November 2022]

Bharadwaj, A., El Sawy, O.A., Pavlou, P.A., & Venkatraman, N. (2013). Digital business strategy: toward a next generation of insights, *MIS Quarterly*, [e-journal] vol. 37, no. 2, pp.471-482, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 24 November 2022]

Bhimani, A., & Willcocks, L. (2013). Digitisation, Big Data and the transformation of accounting information, *Accounting and Business Research*, [e-journal] vol. 44, no. 4, pp. 469-490, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 06 January 2022]

Blank, S. (2013). Why the lean start-up changes everything, *Harvard Bussiness Review*, [e-journal] vol. 91, no. 5, pp.64-72, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 13 November 2022]

Bolisani, E., Scarso, E., Ipsen, C., Kirchner, K., & Hansen, J. P. (2020). Working from home during COVID-19 pandemic: Lessons learned and issues. *Management & Marketing. Challenges for the Knowledge Society*, vol. *15, no.* 1, pp. 458-476. Available online: https://sciendo.com/es/article/10.2478/mmcks-2020-0027 [Accessed 2 January 2023]

Broekhuizen, T.L.J., Broekhuis, M., Gijsenberg, M.J., & Wieringa, J.E. (2021). Introduction to the special issue – Digital business models: A multi-disciplinary and multi-stakeholder perspective, *Journal of Business Research*, vol. 122, pp.847-852, Available online: https://doi.org/10.1016/j.jbusres.2020.04.014 [Accessed 24 November 2022]

Bryman, A. & Bell, E. (2017). *Företagsekonomiska forskningsmetoder*, 3rd edn, Stockholm: Liber AB.

Cappa, F., Oriani, R., Peruffo, E., & McCarthy, I. (2021). Big Data for Creating and Capturing Value in the Digitalized Environment: Unpacking the Effects of Volume, Variety, and Veracity on Firm Performance, *Journal of Product Innovation Management*, [e-journal] vol. 31, no. 1, pp.49-67, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 28 November 2022]

Courchesne, A., Ravanas, P., & Pulido, C. (2019). Using Technology to Optimize Customer Relationship Management: The Case of Cirque du Soleil. *International Journal of Arts Management*, [e-journal] vol. 21, no. 2, pp.1-13, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 25 December 2022].

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, vol. 14*,* no. 4, pp. 532-550. Available online: https://journals.aom.org/doi/abs/10.5465/AMR.1989.4308385 [Accessed 4 January 2023]

Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process,

Technological Forecasting and Social Change, vol. 150, Available online: https://doi.org/10.1016/j.techfore.2019.119791 [Accessed 27 November 2022]

Evans, P. C., & Gawer, A. (2016). *The rise of the platform enterprise: A global survey.* https://www.thecge.net/wp-content/uploads/2016/01/PDF-WEB-Platform-Survey_01_12.pdf [Accessed 19 December 2022]

Fitzgerald, M., Kruschwitz, N., Bonnet, D., & Welch, M. (2013). Embracing Digital Technology A New Strategic Imperative, *MIT Sloan Management Review* [pdf], Available at: https://emergenceweb.com/blog/wp-content/uploads/2013/10/embracing-digital-technology.pdf

Henfridsson, O., & Bygstad, B. (2013). The generative mechanisms of digital infrastructure evolution. *MIS quarterly*, 907-931. [Accessed 21 December 2022]

Herath, T., & Herath, H. S. (2020). Coping with the new normal imposed by the COVID-19 pandemic: Lessons for technology management and governance. *Information Systems Management*, vol. *37*, no. 4, pp.277-283. Available online: https://www.tandfonline.com/doi/abs/10.1080/10580530.2020.1818902 [Accessed 4 January 2023]

Hilbert, M & López, P. (2011). The World's Technological Capacity to Store, Communicate, and Compute Information, *Science*, [e-journal] vol. 332, no. 6025, pp.60-65, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 14 November 2022]

Hisrich, R.D. (2014). *Managing innovation and entrepreneurship*, California: Sage

Honig, B., & Samuelsson, M. (2021). Business planning by intrapreneurs and entrepreneurs under environmental uncertainty and institutional pressure, *Technovation*, vol. 99, Available online: https://doi.org/10.1016/j.technovation.2020.102124 [Accessed 24 November 2022]

Ivanov, D., Das, A., & Choi, T. M. (2018). New flexibility drivers for manufacturing, supply chain and service operations. *International Journal of Production Research*, vol. *56*, no. 10,

pp. 3359-3368. Available online: https://www.tandfonline.com/doi/full/10.1080/00207543.2018.1457813 [Accessed 4 January 2023]

Jabangwe, R., Edison, H., & Duc, A.N. (2018). Software engineering process models for mobile app development: A systematic literature review, Journal of Stystems and Software, vol. 145, pp.98-111, Available online: https://www.sciencedirect.com/science/article/pii/S0164121218301638 [Accessed 19 December 2022]

Jafari-Sadeghi, V., Garcia-Perez, A., Candelo, E., & Couturier, J. (2021). Exploring the impact of digital transformation on technology entrepreneurship and technological market expansion: The role of technology readiness, exploration and exploitation, *Journal of Business Research*, vol. 124, pp.100-111, Available online: https://doi.org/10.1016/j.jbusres.2020.11.020 [Accessed 24 November 2022]

Jamshed, S. (2014). Qualitative research method-interviewing and observation. *Journal of basic and clinical pharmacy*, vol. *5*, no. 4, pp. 87-96. Available online: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4194943/ [Accessed 20 December 2022]

Kallinikos, J., Aaltonen, A., & Marton, A. (2013). The ambivalent ontology of digital artifacts. *Mis Quarterly*, pp.357-370. Available online: https://eds-p-ebscohost com.ludwig.lub.lu.se/eds/pdfviewer/pdfviewer?vid=11&sid=d2c4c94a-6668-4000-8e97-88dad13fd03c%40redis [Accessed 5 January 2023]

Katz, J.A. (2018). Chapter 7: The business plan: reports of its death have been greatly exaggerated, *Annals of Entrepreneurship Education and Pedagogy – 2018*, pp.123-133, Available online: https://doi.org/10.4337/9781788114950.00015 [Accessed 24 November 2022]

Kent, L., Snider, C., Gopsill, J., & Hicks, B. (2021). Mixed reality in design prototyping: A systematic review, Design Studies, vol. 77, Available online: https://doi.org/10.1016/j.destud.2021.101046 [Accessed 06 January 2022]

Kotas, C., Naughton, T., & Imam, N. (2018, January). A comparison of Amazon Web Services and Microsoft Azure cloud platforms for high performance computing. In *2018 IEEE International Conference on Consumer Electronics (ICCE)* (pp. 1-4). IEEE.

Kraus, S., Palmer, C., Kailer, N., Kallinger, F.L., Spitzer, J. (2018). Digital entrepreneurship: A research agenda on new business models for the twenty-first century, *International Journal of Entrepreneurial Behavior & Research*, [e-journal] vol. 25, no. 2, pp.353-375, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 26 November 2022]

König, M., Ungerer, C., Baltes, G., & Terzidis, O. (2019). Different patterns in the evolution of digital and non-digital ventures' business models, *Technological Forecasting & Social Change*, vol. 146, pp.844-852 Available online: https://doi.org/10.1016/j.techfore.2018.05.006 [Accessed 24 November 2022.

LeCompte, M.D., & Goetz, J.P. (1982). Problems of Reliability and Validity in Ethnographic Research, *Review of Educational Research*, vol 52, no 1, pp.31-60, Available online: https://doi.org/10.3102/00346543052001031[Accessed 1 December 2022]

Lemon, K.N., & Verhoef, P.C. (2016). Understanding Customer Experience Throughout the Customer Journey, *Journal of Marketing*, [e-journal], vol. 80, no. 6, pp.69-96 Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 14 November 2022]

Lowenthal, P., Borup, J., West, R., & Archambault, L. (2020). Thinking beyond Zoom: Using asynchronous video to maintain connection and engagement during the COVID-19 pandemic. *Journal of Technology and Teacher Education*, vol. *28*, no. 2, pp. 383-391. Available online: https://www.learntechlib.org/p/216192/ [Accessed 4 January 2023]

Mazumder, S., & Garg, S. (2021). Decoding digital transformational outsourcing: The role of service providers' capabilities, *International Journal of Information Management*, vol. 58, Available online: https://doi.org/10.1016/j.ijinfomgt.2020.102295 [Accessed 08 January 2022]

Majchrzak, A., Markus, M.L., & Wareham, J. (2016). Designing for digital transformation: lessons for information systems research from the study of ICT and societal challenges, *MIS Quarterly*, [e-journal] vol. 40, no. 2, pp.267-277, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 10 November 2022]

Matt, C., Hess, T., Benlian, A., & Wiesbock, F. (2016) Options for Formulating a Digital Transformation Strategy, *MIS Quarterly Executive*, [e-journal] vol. 15, no. 2, article 6, pp.123-139, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 10 November 2022]

Mufti, T., Mittal, P., & Gupta, B. (2020). A review on Amazon web service (AWS), Microsoft azure & Google cloud platform (GCP) services. *Proceedings of the 2nd International Conference on ICT for Digital, Smart, and Sustainable Development, ICIDSSD 2020,* pp.27-28. Available online: https://eudl.eu/pdf/10.4108/eai.27-2-2020.2303255 [Accessed 19 December 2022]

Nambisan, S. (2017). Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship, *Entrepreneurship,* [e-journal] vol. 41, no. 6, pp.1029-1055, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 26 November 2022]

Nationalencyklopedin. (2023). Nationalencyklopedin, Uppslagsverket, Available online: https://www.ne.se/uppslagsverk [Accessed 08 January 2023]

Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation*. John Wiley & Sons, Inc., Hoboken, New Jersey.

Parida, B., Sjödin, D., & Reim, W. (2019). Reviewing Literature on Digitalization, Business Model Innovation, and Sustainable Industry: Past Achievements and Future Promises, *Sustainability*, [e-journal] vol. 11, no. 2, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 28 November 2022]

Poddar, N., & Agarwal, D. (2019). A comparative study of application effectiveness between digital and social media marketing for sustainability of start-ups. *International Journal of*

Business Insights & Transformation, [e-journal] vol. *12,* no. 2, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 25 December 2022]

Puddister, K., & Small, T.A. (2020). Trial by Zoom? The Response to COVID-19 by Canada's Courts, *Canadian Journal of Political Science/Revue canadienne de science politique*, [e-journal] vol. 53, no. 2, pp.373-377 Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 08 January 2022]

Rappa M. (2001). Business models on the web. Managing the digital enterprise, online guide. North Carolina State University, http://digitalenterprise.org/models/models.html [Accessed 5 december 2022]

Reuver, M., Sørensen, C., & Basole, R.C. (2018). The digital platform: a research agenda, *Journal of Information Technology*, [e-journal] vol. 33, no. 2, 124-135, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 27 November 2022]

Reynolds, P., & Miller, B. (1992). New firm gestation: Conception, birth, and implications for research, *Journal of Business Venturing*, vol. 7, no. 5, pp.405-417, Available online: https://doi.org/10.1016/0883-9026(92)90016-K [Accessed 13 November 2022]

Richardson, J. (2008). The business model: an integrative framework for strategy execution, *Strategic Change*, vol. 17, no. 5-6, pp.133-44, Available online: https://doi-org.ludwig.lub.lu.se/10.1002/jsc.821 [Accessed 27 November 2022]

Ritter, T., Pedersen, C.L. (2020). Digitization capability and the digitalization of business models in business-to-business firms: Past, present, and future, *Industrial Marketing Management*, [e-journal] vol. 86, no. 180, pp.180-190, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 08 January 2022]

Ropposch, C., Stiegler, E., & Gubik, C. (2021). Digital entrepreneurs and the origin of their business models. *Journal of Business Models*, [e-journal] vol. *9*, no. 1, pp.43-51, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 27 November 2022]

Rosin, A.F., Proksch, D., Stubner, S., & Pinkwart, A. (2020). Digital new ventures: Assessing the benefits of digitalization in entrepreneurship, *Journal of Small Business Strategy*, vol. 30, no. 2, pp.59–71, Available online: https://libjournals.mtsu.edu/index.php/jsbs/article/view/1543

Ruggieri, R., Savastano, M., Scalingi, A., Bala, D., & D'Ascenzo, F. (2018). The impact of Digital Platforms on Business Models: An empirical investigation on innovative start-ups, *Management şi Marketing,* [e-journal] vol. 13, no. 4, pp.1210-1225, Available through: LUSEM Library website http://www.lusem.lu.se/library

Saunders, M., Lewis, P., & Thornhill, A. (2019). Research Methods for Business Students. 8th ed. Harlow, Essex: Pearson Education Limited

SISP (n.d.) Swedish Incubators and Science Parks, Medlemmar, Available online: https://www.sisp.se/medlemmar [Accessed 09 December 2022]

Srinivasan, A., & Venkatraman, N. (2018). Entrepreneurship in digital platforms: A network‐centric view. *Strategic Entrepreneurship Journal*, vol. *12*, no. 1, pp.54-71, Available online: https://onlinelibrary-wiley-com.ludwig.lub.lu.se/doi/full/10.1002/sej.1272 [Accessed 19 December 2022]

Statista. (2022a). *Number of internet and social media users worldwide as of July 2022*, Available online: https://www.statista.com/statistics/617136/digital-population-worldwide/ [Accessed 15 November 2022]

Statista. (2022b). *Number of internet users worldwide from 2005 to 2021*, Available online: https://www.statista.com/statistics/273018/number-of-internet-users-worldwide/ [Accessed 15 November 2022]

Statista. (2022c). *Daily time spent with the internet per capita worldwide from 2011 to 2021, by device.* Available online: https://www.statista.com/statistics/319732/daily-time-spent-online-device/ [Accessed 15 November 2022]

Statista. (2022d). *Main reasons for business failure among start-ups worldwide in 2021*, Available online: https://www.statista.com/statistics/1271464/start-up-failure-reasons/ [Accessed 14 November 2022]

Teece, D.J. (2010). Business Models, Business Strategy and Innovation, *Long Range Planning*, vol. 43, no. 2-3, pp.172-194, Available online: https://doi.org/10.1016/j.lrp.2009.07.003 [Accessed 24 November 2022]

Tilson, D., Lyytinen, K., & Sørensen, C. (2010). Digital Infrastructures: The Missing IS Research Agenda, *Information System Research*, [e-journal] vol. 21, no. 4, pp.748-759, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 13 November 2022]

Urbinati, C., Bogers, M., Chiesa, V., & Frattini, F. (2019). Creating and capturing value from Big Data: A multiple-case study analysis of provider companies, *Technovation*, vol. 84-85, pp.21-36, Available online: https://doi.org/10.1016/j.technovation.2018.07.004 [Accessed 24 November 2022]

Utz, S., & Breuer, J. (2019). The relationship between networking, LinkedIn use, and retrieving informational benefits. *Cyberpsychology, Behavior, and Social Networking*, vol. *22*, no. 3, pp.180-185. Available online: https://www.liebertpub.com/doi/full/10.1089/cyber.2018.0294 [Accessed 19 December 2022]

Veit, D., Clemons, E., Benlian, A., Buxmann, P., Hess, T., Kundisch, D., Leimeister, J.M., Loos, P., & Spann, M. (2014). Business Models: An Information Systems Research Agenda, *Business & Information Systems Engineerin*g, vol. 6, no. 1, pp.45–53 (2014). Available online: https://www.researchgate.net/publication/259882788_Business_Models_An_Information_Systems_Research_Agenda [Accessed 24 November 2022]

Venkataraman, S. (1997). The distinctive domain of entrepreneurship research: An editor's perspective, *Advances in entrepreneurship, firm emergence, and growth* [pdf], vol. 3, pp.119-138, Available at:

https://www.skylineuniversity.ac.ae/pdf/entrepreneur/The_Distinctive_Domain_of_Entrepreneurship_Researc.pdf [Accessed 24 November 2022]

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, vol. *122*, pp. 889-901. Available online: https://www.sciencedirect.com/science/article/pii/S0148296319305478 [Accessed 24 November 2022]

Vial, G. (2019). Understanding digital transformation: A review and a research agenda, *The Journal of Strategic Information Systems*, vol. 28, no. 2, pp.118-144, Available online: https://doi-org.proxy.lnu.se/10.1016/j.jsis.2019.01.003 [Accessed 13 November 2022]

Walliman, N. (2010). Research methods: The basics, 2nd ed. London: Routledge

Wan, M. (2022). Research methods. *CSR Image Discursive Construction of Banks and the Effects on Capital Markets,* pp.69-86. Available online: https://books.google.co.ke/books?hl=en&lr=&id=_LCbEAAAQBAJ&oi=fnd&pg=PR6&dq=Wan,+M.+(2022) [Accessed 4 January 2023]

Williams, C. (2007). Research methods. *Journal of Business & Economics Research (JBER)*, vol. *5*, no. 3, pp. 1-12. Available online: https://clutejournals.com/index.php/JBER/article/view/2532 [Accessed 4 January 2023]

Xian, H. (2008). Lost in translation? Language, culture and the roles of translator in cross‐cultural management research, *Qualitative Research in Organizations and Management*, vol. 3, no. 3, pp.231-245, Available online: https://doi-org.ludwig.lub.lu.se/10.1108/17465640810920304 [Accessed 2022-12-01]

Yang, J., Basile, K., & Letourneau, O. (2020). The impact of social media platform selection on effectively communicating about corporate social responsibility. *Journal of Marketing Communications*, vol. *26*, no. 1, pp. 65-87. Available online: https://www.tandfonline.com/doi/abs/10.1080/13527266.2018.1500932 [Accessed 4 January 2023]

Zaheer, H., Breyer, Y., & Dumay, J. (2019), Digital entrepreneurship: An interdisciplinary structured literature review and research agenda, *Technological Forecasting and Social Change*, vol. 148, Available online: https://doi.org/10.1016/j.techfore.2019.119735 [Accessed 27 November 2022]

Zott, C., Amit, R., & Massa, L. (2011). The Business Model: Recent Developments and Future Research, *Journal of Management*, [e-journal] vol. 37, no. 4, pp.1019-1042, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 10 November 2022]

Appendix

1 Intervjuguide (Svenska)

Presentation av arbete

Tack för att ni ställer upp och medverkar i denna intervjun. Just nu läser vi den sista delen inför ekonomi kandidatexamen inom entreprenörskap och innovation, varav detta är ett bidrag till kandidatuppsatsen. Vi undersöker relationen mellan digitalisering och digital teknologi med affärsmodellen för startups. Med digital teknologi menar vi till exempel digitala plattformar (sociala medier), infrastruktur (digitala system/verktyg - Big Data) och digitala artefakter (Mjuk- och hårdvarukomponenter).

Information

Är det okej för dig att vi spelar in intervjun samt för anteckningar under tiden? Inspelningen kommer endast att vara tillgänglig för oss två (Yara & Adam) och kommer att transkiberas sedan, alltså skrivas ner och senare användas i vår studie. Eran anonymitet är viktig för oss och vi kommer därför varken nämna dig eller företaget vid namn.

Då vår uppsats skrivs på engelska kommer intervjun efter transkribering att översättas från svenska till engelska och vi hade varit tacksamma om ni ville läsa igenom transkriberingen som eventuellt kommer att användas för citat. För att säkerställa att vi fått med allting och att inget blivit missuppfattat vid transkribering och översättning. Det är även viktigt för oss att ingen potentiellt känslig information inkluderas så detta är ytterligare ett steg för att säkerhetsställa det kriteriet.

Kontext 1: Bakgrund

Trots att ni kommer att vara anonyma skulle vi vilja ställa lite allmänna frågor om er och företaget.

1. Berätta lite om dig själv och din roll i företaget?
2. Berätta kort om företaget, vad är det ni erbjuder?
3. Skulle du kunna berätta om hela er resa från det att företaget registrerades till där ni är idag, med fokus på milstolparna under den resan? Gärna så detaljerat som möjligt.

Kontext 2: Digitaliseringens påverkan och förändringar i affärsmodellen

4. Har er produkt/service förändrats under den tiden?
    - ➢ **Om ja**, hur och var har dessa förändringar skett?
    - ➢ **Om nej**, varför inte?
5. Hur har digitaliseringen påverkat den processen för respektive förändring?
6. Vad är ert kundsegment och har detta varit likadant sedan start?
    - ➢ **Om ja**, var har den förändringen skett?
7. Hur skulle du säga att kundrelationerna har utvecklats under resans gång?
8. Finns det något som utmärker digitaliseringens möjligheter och/eller utmaningar mellan er och kund?
9. Finns där några tillfällen sedan start där förändringar har gjorts i era aktiviteter för att stärka bandet mellan produkt/service och kund?
    - ➢ **Exempel/Inriktningar:** Marknadsundersökning, marknadsföring, utbildning, nätverkande
10. Har användning av digitala plattformar eller andra kanaler varit viktiga och hur har det förändrats med tiden?
    - ➢ Vilka resurser har varit viktiga för att utföra dessa aktiviteter?
        - ○ **Exempel/Inriktningar:** Finansiella, intellektuella, humana, fysiska
11. Hur har digitaliseringen hjälpt och/eller hindrat möjligheterna att utföra dessa aktiviteter?
12. Hur har kostnads- och intäkts struktur sett ut över tid i jämförelse med era milstolpar?
    - ➢ Vad skulle du säga är anledningen till att det gått bra respektive dåligt?
13. Har ni sett att digitaliseringen medfört förändringar i kostnads- och intäkts strukturen?
    - ➢ **Om ja,** vad är det för förändringar?
    - ➢ Finns det några för och nackdelar med dessa förändringar?
    - ➢ Skulle du säga att digitaliseringen medfört nya intäkter?
14. Har kundernas betalningsvilja förändrats?
    - ➢ **Om ja,** var och när insågs detta?
15. Har delar i affärsmodellen förändrats för att gynnas av digitaliseringen?
    - ➢ **Om ja,** hur då?
16. Fanns det några möjligheter/utmaningar med digital teknologi?

17. Finns det i efterhand några digitala teknologier som ni anser att ni borde, respektive inte borde ha använt er utav i ett tidigare skede?
    - ➢ Varför borde/ borde inte dem inkluderats?
18. Finns det någon av dessa delar där digital teknologi varit extra viktigt?
    - ➢ Kan du ge exempel på vilka digitala teknologier i så fall och hur dessa har bidragit till mer värde?

Avslutning

19. Har du någon vidare fundering, fråga eller skulle vilja tillägga något som du tror kan vara av vikt för oss som vi missat täcka in?
20. Är det okej att vi hör av oss om vi skulle behöva komplettera någon av frågorna?

Definitioner begrepp:

Digitalisering: Hur samhällens och företags sociala och tekniska aspekter av infrastrukturen förändras när information blir digitalt.

Affärsmodell: En representation av vad verksamheten erbjuder, värdeerbjudande, aktiviteter och kanaler för att skapa och leverera värde till kund samt hur detta genererar intäkter i förhållande till kostnader.

Value propositions: Vad verksamheten erbjuder för en kunds specifika behov. Att skapa en konkurrensfördel genom att leverera innovativa produkter och tjänster.

Value creation och value delivery: Syftar på hur värdeerbjudanden skapas som konkurrenskraftiga resurser eller levereras med skräddarsydd logistik.

Value capture: Den ekonomiska grunden eller intäktsmodellen, hänvisar till hur inkomster uppstår och kostnaden för att göra det.

2 Interview guide (English)

Presentation of work

Thank you for participating in this interview. We are doing the last part for the economics bachelor's degree in entrepreneurship and innovation, of which this is a contribution to the bachelor's thesis. We examine the relationship between digitalisation and digital technology with startups' business models. By digital technology, we mean, for example, digital platforms (social media), infrastructure (digital systems/tools - Big Data), and digital artifacts (Software and hardware components).

Information

Can we record the interview and take notes during it? The recording will only be available to the two of us (Yara & Adam), transcribed (written down), and later used in our study. Your anonymity is important to us, and we will not mention you or the company by name. It is also important to not include any potentially sensitive information, so this is another step to secure that criterion.

Context 1: Background

Although you will be anonymous, we would like to ask some general questions about you and the company.

1. Tell us a little about yourself and your role in the company.
2. Briefly tell us about the company; what is the offering?
3. Could you tell us about the entire journey from when the company registered to where it is today, focusing on the milestones during that journey? Preferably as detailed as possible.

Context 2: Digital impact and business model changes

4. Has the product/service changed during that time?
    - ➢ **If so**, how and where have these changes occurred?
    - ➢ **If not**, why not?
5. How has digitalisation affected that process for each change?
6. What is the customer segment, and has this been the same since the start?

- ➢ **If so**, where has that change occurred?

7. How have customer relations developed during the journey?
8. Is there anything that distinguishes the possibilities or challenges of digitalisation between the company and the customer?
9. Are there any occasions since the start where changes have been made in activities to strengthen the bond between product/service and customer?
    - ➢ **Examples/Directions:** Market research, marketing, education, networking
10. Has digital platforms or other channels been vital, and how has it changed over time?
    - ➢ What resources have been significant in carrying out these activities?
        - ○ **Examples/Focuses:** Financial, intellectual, human, physical
11. How has digitalisation helped or hindered the ability to carry out these activities?
12. How has cost and revenue structure looked over time compared to the milestones?
    - ➢ What would you say is why it went well or poorly?
13. Have you seen that digitalisation has brought about changes in the cost and revenue structure?
    - ➢ **If yes**, what are the changes?
    - ➢ Are there any pros and cons to these changes?
    - ➢ Would you say that digitalisation has brought new revenue?
14. Has the customers' willingness to pay changed?
    - ➢ **If so**, where and when was this realised?
15. Have parts of the business model changed to benefit from digitalisation?
    - ➢ **If so**, how?
16. Did any opportunities/challenges with digital technology exist?
17. In retrospect, are there any digital technologies you believe you should or should not have used earlier?
    - ➢ Why should or should not they be included?
18. Are there any areas where digital technology has been essential?
    - ➢ **If so**, can you give examples of which digital technologies and how these have contributed to more value?

Closing

19. Do you have any further thoughts or questions, or would like to add something that may be of importance we missed covering?
20. Is it okay to contact you if we need to complement any of the questions?

Definitions terms:

Digitalisation: How societies and companies' social and technical aspects of the infrastructure change when information becomes digital.

Business model: A representation of what the business offers, value proposition, activities, and channels to create and deliver value to the customer and how this generates revenue concerning costs.

Value proposition: What the business offers for a customer's specific needs. To create a competitive advantage by delivering innovative products and services.

Value creation and value delivery: Refers to how value propositions are created as competitive resources or delivered with tailored logistics.

Value capture: The financial basis, or revenue model, refers to how to generate income and the cost of doing so.