



Digital Transformation in the Healthcare Sector: How digital platforms can improve the healthcare industry

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Abstract

The healthcare industry currently is going through a digital transformation. New technologies impact the structure of the industry as well as the business models of existing healthcare organizations. Through this transformation, new industry opportunities arise. This thesis aims to analyze the potential that digital healthcare platforms can offer to organizations and their stakeholders, and how these platforms can improve the healthcare system. Based on the analysis of eight expert interviews, the key findings emphasize the importance of creating patient-focused platforms to improve access to healthcare. It is crucial to overcome industry challenges such as tight regulatory restrictions, to be able to build a digital healthcare ecosystem that connects different players and combines their distinct goals. Key drivers that impacted the rise of patient-centered platforms and here-with simplified access to healthcare were advances in technology, the COVID-19 pandemic, regulatory changes, and increased patient empowerment. New value streams open up for healthcare organizations when implementing platforms that aim to digitalize the patient journey end-to-end. By addressing new patient needs and entering new markets with the help of digital tools, revenues can be increased. Encouraging information sharing and collaboration among stakeholders within the healthcare system is cost and time efficient and can contribute to improved profitability. Digital platforms are an attractive opportunity for healthcare organizations and can contribute to an improved healthcare industry by creating an interconnected ecosystem.

Key Words: Digital Platform, Healthcare Ecosystem, Patient Journey, Digital Healthcare

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Resumo

As novas tecnologias afetam a estrutura do setor de saúde e os modelos de negócio das organizações existentes. Através da transformação digital, surgem novas oportunidades no setor de saúde. Esta tese tem como objectivo analisar o potencial que as plataformas digitais podem oferecer às organizações e como podem melhorar o sistema de saúde. Com base na análise de oito entrevistas a especialistas, as principais conclusões sublinham a importância de criar plataformas centradas nos pacientes para melhorar o acesso aos cuidados de saúde. É crucial ultrapassar os desafios do setor para poder construir um ecossistema digital de cuidados de saúde que ligue diferentes intervenientes e combine seus objectivos distintos. Os principais factores que influenciaram o surgimento das plataformas centradas nos pacientes foram os avanços tecnológicos, a pandemia de COVID-19, as alterações regulamentares e o aumento da autonomia dos pacientes. As plataformas que visam digitalizar o percurso do doente de ponta a ponta abrem novos fluxos de valor para as organizações de cuidados de saúde. Ao atender às novas necessidades dos pacientes e ao entrar em novos mercados com a ajuda de ferramentas digitais, é possível aumentar as receitas. Incentivar a partilha de informações e a colaboração entre as partes interessadas no sistema de saúde é eficiente em termos de custos e de tempo e contribui para a melhoria da rentabilidade. As plataformas digitais são uma oportunidade atrativa para as organizações de cuidados de saúde e podem contribuir para melhorar o setor de saúde, criando um ecossistema interligado.

Palavras chave: Plataforma Digital, Ecossistema de Saúde, Percurso do Paciente, Saúde Digital

Título: Transformação digital no sector da saúde: como as plataformas digitais podem melhorar o sector da saúde

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1 Introduction

The digital era and the herewith associated evolution of technology have a significant impact on the business world. It affects business strategies, its processes, the role of employees, and customer relationships of organizations. A major trend brought by the digital era is the process of digital transformation (Schwertner, 2021). It has revolutionized industries over the past decades, from the manufacturing sector, where it is indispensable now, to many other sectors such as the fashion or travel industry (Schwertner, 2017; Aagard, 2019). A typical example is the company Airbnb. It is a firm which converted the hospitality industry worldwide by following the digital platform business model. Starting from the simple idea of offering cheap accommodation for travellers inside their own homes, Airbnb quickly grew into a global marketplace where people rent out their home and other properties (Parker et. al, 2016). Digital transformation can thereby be defined as the implementation of technology to develop new business models, products and services through digital innovation (Schwertner, 2017; Aagard, 2019). Implementing new technologies allows companies to exploit benefits such as increased efficiency through optimized processes, resulting in cutting costs. Based on a study from the Massachusetts Institute of Technology, businesses that underwent digital transformation on average generate higher profits by 26% than before (Schwertner, 2021).

Besides making use of novel machines, systems and software, another interesting aspect of the digital era is the development of new organizational strategies such as the platform model. Traditional industry structures get disrupted by digital platforms (World Economic Forum, 2016; Reillier & Reillier, 2017), which make use of digital tools to link people, organizations, and resources in a dynamic ecosystem to generate and transfer value (Parker et. al, 2016).

A platform strategy can be pursued by any organization where the acquisition of information about changing customer requirements, new market trends and fluctuating prices is essential - which applies to any type of business (Parker et. al, 2016). Hence, these platforms can be quickly established in multiple sectors to offer new experiences (World Economic Forum, 2016; Reillier & Reillier, 2017).

On the one hand, many industries have identified valuable opportunities, intensively started introducing new technologies and/or shifted to platform strategies to create

innovative and more efficient businesses. On the other hand, resource-intensive, strictly regulated industries with significant costs of failing are still at the beginning of this transformation. One of them is the healthcare industry. Nevertheless, it is believed that platform models could revolutionize this sector by connecting consumers and suppliers directly, and herewith simplify the access to healthcare for patients (Parker et. al, 2016; Ozalp et. al, 2022). In addition, through the COVID-19 pandemic, patient's needs have changed and the requirement to create innovative and easy-to-use healthcare services has intensified (Perna, 2022).

This thesis focuses on the future of the healthcare industry. According to Statista (2022), the digital health market in Europe is projected to reach a value of \$ 29.35bn in 2023, with an annual growth rate of 8.6%. It can be argued that the healthcare industry is highly profitable with still a lot of growth potential. Hence, it is no surprise that an increasing number of companies with a digital business model enter this market and try to get a share of it.

Newly developed platform strategies aim to create a user-friendly ecosystem, and herewith facilitate the access to healthcare for patients. These platforms opt to have their own network of doctors, medical practices and pharmacies, and offer 24/7 accessibility to healthcare by integrating tools such as online booking and video consultation, all in one place. So far, only a few platforms like this exist in Europe, but more are in development and will arise in the future.

1.1 Business Relevance

In 2022, four out of the five world's biggest companies by market capitalization - named Apple, Alphabet, Microsoft and Amazon - were platform-powered (Johnston, 2022). But their success goes beyond market capitalization. Further studies illustrate that return on assets, gross profits, and sales growth from platform businesses are also substantially surpassing the ones from traditional organizations (Reillier & Reillier, 2017). This indicates that digital transformation is defining the future and pushes organizations to re-consider their business approaches to remain successful (World Economic Forum, 2016).

Another study by Deloitte and MIT Sloan management review depicts that 90% of the interviewed executives expect that digital trends will significantly disrupt their

business sectors. As a result, there is an existing need for a comprehensive understanding of potential impacts on organizations, and how these new challenges can be tackled (Aagaard, 2019).

Multiple industries have already started implementing digital tools to improve their efficiency, however, certain industries such as the healthcare sector are still lagging behind. One of the main reasons are large information asymmetries in this highly fragmented market (Parker et. Al, 2016). It is vital for the healthcare industry to keep up with the digital trend in order to provide high quality services to all patients, and design them in an innovative and user-friendly way.

1.2 Academic Relevance

An extensive literature review shows that an abundance of articles can be found on the topic of digital transformation in healthcare. They explain the reasons for this industry to be behind in digital transformation compared to others, and why only a few businesses follow platform strategies (Ozalp et. al, 2022; Parker et. al, 2016). More importantly, they describe potential benefits offered by the transformation to platform strategies and point out the market need (Reillier & Reillier, 2017; Ozalp et. al, 2022; Stone, 2019; Zenooz & Fox, 2019).

Digital platforms already exist to optimize internal and external processes for hospitals and other healthcare centers, as well as for patients, for example to book a doctor's appointment online. However, the power of having one single platform which combines the whole patient journey end-to-end by directly linking patients with healthcare providers, has not yet been fully discovered in Europe. This emphasizes the requirement of further research on the topic to identify the potential of digital platforms in the healthcare sector.

1.3 Research Questions

This thesis aims to analyze the development and the potential which digital platform strategies have to offer to healthcare organizations and its main stakeholders. Through a literature review and additional expert interviews, the goal is to answer following research questions:

1. What are the key drivers that push the healthcare sector in Europe to transform into a more patient-focused industry?
2. How can healthcare organizations simplify access to patients with help of digital platforms?
3. What new value streams can healthcare organizations access by implementing digital platforms?

The outcome of this thesis will assess if and how the healthcare system can be improved through one platform that combines the whole patient journey. This should serve healthcare institutions to better understand the advantages of implementing digital platforms which create a closer and simplified connection to patients through additional digital services. They should feel encouraged to rethink their business practices and consider taking first steps towards the creation of new and innovative services for their patients.

1.4 Scope of the Thesis

According to Aagaard (2019), “digitalization is a multi-faceted concept that induces changes in many parts of the organization” (p.149). It can integrate higher automated processes in supply chains, create digitized products, or strategically deviate “from product-based to service-based offerings” (Bughin & van Zeebroeck, 2017, p.82). While all these changes are interesting opportunities for businesses from any kind of industry to consider when it comes to digital transformation, this thesis only focuses on the digital platforms in the healthcare industry, mainly from the perspective of healthcare organizations. The scope is therefore limited to digital healthcare platform businesses in Europe which opt to facilitate access and improve patient experience by combining the whole patient journey end-to-end.

1.5 Structure of the Thesis

The introduction of this thesis provides a first insight into the topic of digital transformation in the healthcare sector, and why it is relevant to conduct further research.

The second chapter builds the theoretical framework, which is based on the literature review. A literature review is essential to gain general knowledge and overview about digital transformation, and how it has impacted organizations. Furthermore, new

opportunities that arose through the digital era will be discussed. In a second part, the rise of digital platform business models will be explained. The different types of platform models are presented, and its benefits and challenges highlighted. Subsequently, the healthcare industry is defined and it is explained how it was affected by digitalization.

The theoretical framework is followed by the description of the applied methodology. For this thesis, a qualitative research method has been chosen. Data collection was done through semi-structured interviews with eight different industry experts. Based on the knowledge gained through the literature review, the interview questionnaires can be created. Interviews with companies which developed a platform model that aim to combine the whole patient journey will be held to understand the motivation behind creating such business strategies. Additionally, other experts in the healthcare sector will be interviewed to obtain further insights into the industry from a holistic point of view.

In the findings, the expert interviews will be analyzed by following the coding scheme of the grounded theory, developed by the sociologists Barney Glaser and Anselm Strauss. It is a three-step method where the answers of the interviews are compared and categorized to formulate new theories based on real world insights.

The discussion part combines the information gained through the literature review and the key findings of the interview analysis, and ultimately aims to answer the research questions.

Finally, a conclusion will be drawn that sums up the outcome of this thesis, includes its limitations, and highlights gaps to pursue in further research.

2 Theoretical Framework

In this chapter, fundamental terms and theories such as digital transformation, platform businesses and the digitalization in the healthcare sector are explained in order to provide an understanding of the significance of certain definitions, and to put them into the context of this thesis.

2.1 Digital Transformation

Digital transformation can be defined as the adaption of technology in every aspect of an organization, leading to central adjustments in its operations, and how customer value is created (Aagaard, 2019). Through this augmentation, firms modify their operations, alter how business functions collaborate, and expand the boundaries of the company. The goal is to enhance organizational performance by adjusting processes and re-designing customer experience (Stone, 2019; Aagaard, 2019).

Transformation is a process that can be defined as a modification in the aspect or nature of something, with the specific goal of enhancing their quality or value. (Cambridge Dictionary, 2023). Additionally, the term “to transform” can refer to an alteration in composition or structure of something (Stone, 2019, p. 21). There are two approaches linked to digital transformation. Firstly, the term digitization needs to be understood. The procedure to modify analog data into a digital format is called digitization (Accenture, 2023). The second concept is called digitalization, which is the application of digital tools to alter business operations and processes. To sum up, certain information of a company first need to be digitized to undergo the process of digitalization, which as a result transforms the organization with the help of innovative technology.

2.1.1 New Opportunities and Benefits for Companies

The emergence of advanced technologies can open up new opportunities, as the application of digital tools leads to organizational as well as product and service innovations (Aagaard, 2019). Girdwichai (2020) highlights the importance of following digital strategies. According to his theory, firms with the highest growth rates are the ones operating in an online environment. The implementation of digital transformation can create multiple benefits for companies, which will be explained in this subchapter.

When a company undergoes digitalization, its internal and external processes need to be revised and adjusted to implement and leverage digital tools properly. Deciding on which procedures are core to the business, and how they relate to other organizational processes, indicates where technology can be integrated to enhance organizational operations (Bughin & van Zeebroeck, 2017). Process improvements ultimately lead to higher organizational efficiency and increased agility, which allows companies to react quickly to changing customer needs (Stone, 2019; Accenture, 2023). Consequently, the adjustment of central procedures directly impacts the organizational structure, which builds the foundation for the company's new business model (Stone, 2019). Digitalization pushes firms to test innovative business models which differ from their initial company structure and strategy (Bughin & van Zeebroeck, 2017), and accelerate the overall growth of their business (Girdwichai, 2020; Accenture, 2023).

Furthermore, digital transformation breaks down conventional market entry barriers, as physical boundaries along the supply chain and the company's core principles are removed (Girdwichai, 2020). Adequate application of innovative technologies reduces costs, increases automation, and elevates services for current clients. More importantly, new customer segments can be targeted instead of solely focusing on existing clients, which is essential to ensure the success of an organization. Not only new customers but also new markets can be reached with digital business models (Girdwichai, 2020; Stone, 2019). It generates economic forces which enable companies to expand their scope. Entering a market through the digital path allows firms to exploit the accumulated data across industries. Companies can take advantage of existing industry knowledge and through data analysis identify new synergies to build on (Gawer, 2022). Erasing entry barriers by following a new business model makes it easier for a company to take away market share from existing competitors (Bughin & van Zeebroeck, 2017).

To summarize, by taking advantage of these opportunities which digital transformation offers, firms can improve their competitive position, future-proof their business by keeping up with upcoming market trends, and ultimately grow their company at a faster pace.

2.1.2 Challenges of Digital Transformation for Companies

As digital transformation impacts almost any aspect of an organization, it also is connected to inevitable challenges when it comes to its implementation. Digital transformation can lead to higher competition, since the barriers to accessing a market for newly established firms are lowered (Gawer, 2022; Girdwichai, 2020). Additionally, new products and services can be created by new or existing competitors who leverage advanced technologies. New market entrants have the power to reshape existing markets and push them in a digital direction through their newly developed business models (Accenture, 2023). Consequently, consumer behavior might be changed and new client needs arise which then also need to be taken into consideration by existing companies.

If companies do not keep up with technological innovation and fail to react to changes in the market on time, they most likely will be surpassed by their competitors who did. Common examples are the firms called Blackberry, Motorola, Kodak, and Nokia. They used to be leaders in their fields, but due to missing new technology trends and novel customer needs, they struggled to remain profitable (Stone, 2019). Hence, companies that wish to remain successful must continuously reinvent themselves (Cusumano, 2010).

Based on the Digital Business Global Executive Survey in 2014, 43% of the participants stated that the biggest barrier to implementing digital transformation projects is that too many competing company priorities exist (Kane et. al, 2015). For a successful transformation, the company structure needs to be adjusted. Integrating new technologies into existing systems can be complex and compatibility issues may arise (Matt et. al, 2015).

A shortage of employees with the necessary skills and expertise to implement and maintain digital technologies can impede progress (Stone, 2019; Aagaard, 2019). In addition, the company might face resistance from its employees or other stakeholders affected by the change (Matt et. al, 2015). Without a clear strategy and predefined goals, it can be difficult to measure the success of digital transformation initiatives and ensure that they align with the overall business objectives. Due to these reasons, clear objectives and strong guidance from the leadership are required to conduct the transformation successfully (Stone, 2019; Matt et. al, 2015).

Furthermore, integrating new digital solutions is a costly procedure. If companies don't consider investments into digital transformation projects as strategic changes, the company might lack in ability to finance the transition properly (Matt et. al, 2015).

Moreover, digital maturity plays an important role, as it indicates an organization's readiness for change. With higher digital maturity, concerns about data security often arise (Kane et. al, 2015). Digital transformation often involves the collection, storage, and analysis of large amounts of data, which can raise concerns about privacy and security (Gawer, 2022).

2.2 Platform Businesses

As discussed in chapter 2.1.2, one of the main challenges when implementing new technologies into an organization is the structuring of a company's business model (Aagaard, 2019). In the following section, the definition and opportunities of digital platform business models are further explained.

2.2.1 Definition of a Platform Business

A platform business can be defined as an organization that allows the co-creation of value by enabling the interaction of multiple stakeholders (Parker et. al, 2016; Reillier & Reillier, 2017; Gawer, 2022). In order to do so, a platform offers the required network governed by certain rules. The overall goal of a platform is to simplify the transaction of goods and services by linking different users (Parker et. al, 2016; Gawer, 2022). Common examples of platforms are "online marketplaces, app stores, search engines, social media, and platforms for the collaborative economy" (Gawer, 2022, p. 112).

However, it is also stated by Reillier & Reillier (2017) that the majority of companies are not solely platform businesses but rather follow a hybrid business model which is platform-powered.

"A platform-powered ecosystem can then be defined as a group of organizations – under the same ownership or strategically linked – that derives significant value from at least one platform business. These platform ecosystems leverage the interplay between the various business models that are part of the ecosystem to reinforce customer propositions and create stickiness, often with spectacular success." (Reillier & Reillier, 2017, p. 28).

To put it in simpler terms, such companies mix two different business models to have a physical and online presence.

An essential aspect of a platform to become successful is the creation of trust among users. However, before users build trust with one another, they need to be assured that they can rely on the business idea of the platform. The kind of interaction offered by the platform is decisive for the required level of trust by users. It can be argued that platform businesses, such as marketplaces, which provide access to simple product and service offerings, demand a lower trust level, as opposed to platforms with high-stakes transactions. An example of a more complex service provider in the healthcare sector is the company called “Doctolib”, which connects patients with qualified doctors and enables them to book appointments online (Reillier & Reillier, 2017).

2.2.2 Value Creation

Digital platforms open up new opportunities for firms to create significant value for their stakeholders (Accenture, 2023). As opposed to traditional business models, digital platforms differ in their value chain (Reillier & Reillier, 2017). How they differentiate from each other will be explained in this section.

Michael Porter developed the linear value chain which explains that with the help of a linear set of primary activities, value is added to the input, to maximize production output. His model also distinguishes between core and non-core activities which support the whole procedure throughout the value chain of a product or service. Following a traditional business model, competitive advantage can be achieved by lowering costs of primary and supportive activities, or by conducting them in a special way to differentiate from competitors (Reillier & Reillier, 2017).

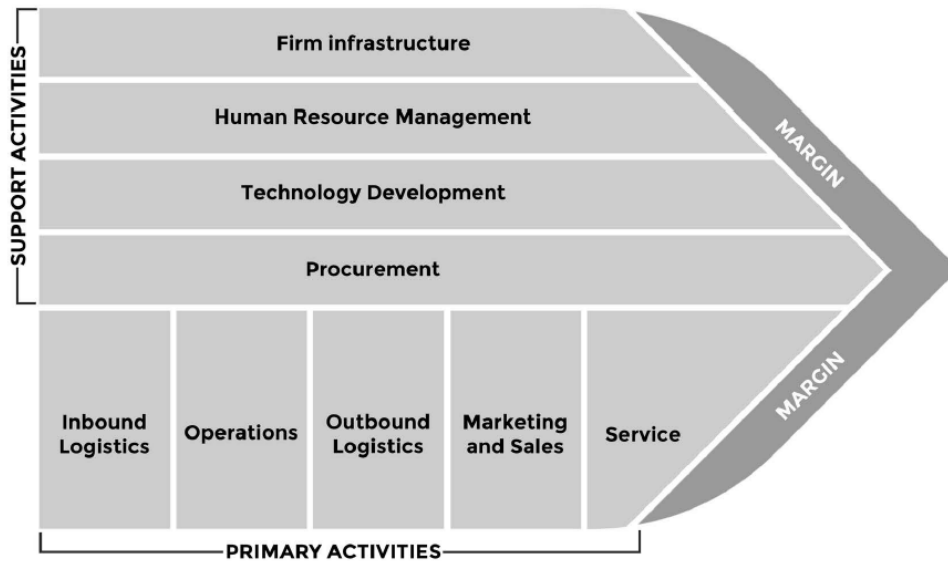


Figure 1: Michael Porter's Value Chain (1985) (source: Reillier & Reillier, 2017)

This value chain might be disrupted by new, inventive companies which follow a more dynamic approach to create value. Suddenly, not only the company itself, but also business partners, clients, and other stakeholders are involved in the value creation and contribute to it. As a result, the business model canvas has been created by Alex Osterwalder, to capture all incoming value streams (Reillier & Reillier, 2017).



Figure 2: The Business Model Canva by Alexander Osterwalder (source: Reillier & Reillier, 2017)

The benefit of the business model canvas is that it can be applied by any type of organization, no matter the business model, company structure, or maturity of the firm. It is divided into the following nine sections, which depict the key activities and the different value streams of the company: Key partners, key activities, key resources, value proposition, customer relationships, channels to engage clients, customer segments, cost structure, and revenue streams (Reillier & Reillier, 2017).

2.2.3 The Rocket Model

The rocket model has been created by Launchwork & Co. It explains how the launch of a digital platform differs from companies following traditional business models. Depending on the company's central activities, platforms typically perform in a multi-sided market (Reillier & Reillier, 2017). A multi-sided market can be defined as different markets with co-dependent user client segments (Evans, 2003). For a successful implementation of a platform, it needs to focus on engaging a wide range of customers to reach critical mass on both market sides, match and link them to facilitate transactions, and at the same time enhance its ecosystem continuously. High efforts are required to start a two-sided platform business, as it can be compared to the launch of two firms simultaneously. Both market sides need to attract a significant customer base with the aim of attaining critical mass, a tough challenge that firms that follow a classic business model do not face. However, once this has been achieved, less energy and investments are needed as the platform can support itself and further grow due to the network effect (Reillier & Reillier, 2017).

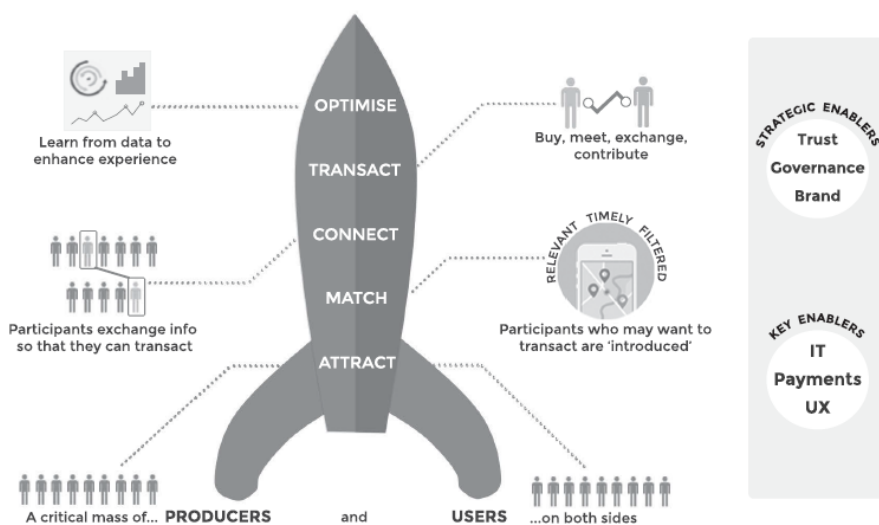


Figure 3: The Rocket Model (source: Reillier & Reillier, 2017)

Multiple enablers support the rocket model to allow the take-off of the platform business. The most common enablers are:

- *Governance framework*: It impacts the value creation within the ecosystem of the platform as it defines what kind of users are permitted to enter the platform and regulates the interactions among them.
- *Trust*: The platform should provide a safe space for all users to make them feel comfortable when interacting with other participants and to allow them to make trustworthy transactions.
- *Brand*: It is closely linked to trust and difficult to create, as the brand image gets directly impacted by its users. Hence, platform businesses must understand the requirements and desires of their communities and manifest those features within their values.
- *User experience*: It can include online and/or offline experiences, depending on the different customer touchpoints throughout the customer journey. However, platform businesses only have a restricted impact on the user experience, as individuals interacting on the platform also directly contribute to it.
- *Infrastructure*: The platform's technical infrastructure belongs to its success factors and needs to be adjustable over the different development phases of the business.
- *Payments*: Smooth, simple, and secure payments need to be feasible for users through the platform.

A close collaboration of these factors is essential for a platform firm's success.

2.2.4 Different Types of Platforms

According to Gawer (2022), three different types of platforms can be distinguished: Transaction platforms, innovation platforms, and hybrid platforms.

Transaction platforms offer a system that connects demand and supply on a global level. Thereby, they facilitate transactions between consumers and companies or other individuals, which offer goods and services online. These interactions not only lead

to an exchange of products and services but also facilitate data sharing via the web. Well-known examples of transactional platforms are Google Search and Amazon Marketplace.

Innovation platforms act as technological stepping stones, allowing third parties to create supplementary goods and services. As an example, they enable software developers to augment performance and features of existing products such as Microsoft Windows, or Google Android.

Hybrid platforms are an aggregation of features of innovation and transaction platforms. Typical examples are Google, Amazon, Microsoft, Apple, and Facebook.

2.2.5 Ecosystems and Network Effects of a Platform Business

As learned in the previous chapters, firms with the highest market capitalization are platform-powered. Cusumano (2010) states that the companies with the highest revenues operate as a platform business. This business model enables organizations to compete across multiple areas of an industry, and not solely within one product range. This industry-wide competition is captured in a firm's ecosystem (Reillier & Reillier, 2017).

An ecosystem is a dynamic environment built by co-dependent organizations that cooperate based on certain regulations and autonomous mechanisms (Reillier & Reillier, 2017; Benedict & Schlieter, 2015). Operating in such an ecosystem increases the likelihood to be innovative and enables the company to further develop its business, as compared to a firm that only focuses on one product (Cusumano, 2010).

With this new business model, executives are challenged to not only develop strategies that determine what the firm intends to achieve in the future, but also adhere to their company's organizational abilities and competencies that differentiate themselves from traditional practices. These new practices focus on people, procedures, and aggregated know-how that creates a clear comprehension of technology and business, and its development. Linking strategy with strong, newly acquired abilities allows an organization to develop innovative goods and service offerings, and thus enables them to spot new trends and leverage upcoming opportunities to expand their business (Cusumano, 2010).

A firm that intends to develop an industry-wide platform most likely is required to divide profits with other stakeholders in the ecosystem. Even though such strategies might come off as cost-intensive at first, their potential to generate significant profits in

the long run is much higher (Cusumano, 2010). This high success rate can be explained by the network effect, which means that a platform increases its value, the more users it counts (Reillier & Reillier, 2017; Gawer, 2022; Cusumano, 2010; Ozalp et. al, 2022). With the network effect, not only the value of the platform itself increases due to increased traffic, but also the value offered to all participants in the ecosystem. When a higher number of producers enter the network, a wider user segment can be attracted (Reillier & Reillier, 2017; Cusumano, 2010).

To sum up, network effects have a powerful impact on the growth rate of a platform business, hence it is hard to keep fair competition in digital markets (Gawer, 2022).

2.2.6 New Opportunities through Platform Businesses

Following a platform strategy opens up multiple new opportunities for organizations and their customers. As discussed in chapter 2.2.5, digital platforms have the ability to create ecosystems and through them benefit from the network effect. This effect initiates rapid growth for platform businesses by connecting different customer groups and large communities (Reillier & Reillier, 2017; Ozalp et. al, 2022; Stone, 2019). Growth is also accelerated due to cost-efficient management and reduced expenditure on transactions, facilitated by the use of digital intermediates such as clouds or the internet (Reillier & Reillier, 2017; Ozalp et. al, 2022).

The data aspect is worth mentioning, as it creates a major opportunity for platform businesses. By continuously accumulating a high amount of data generated through its users, platforms can increase in value. Data analysis is considered a key factor for platform expansion. It allows digital businesses to react to new consumer trends quickly. Leveraging on data outputs facilitates firms to add innovative services to their portfolio, and herewith also tap into new market segments (Gawer, 2022; Ozalp et. al, 2022; Stone, 2019).

2.3 Digital Transformation in Healthcare

As stated by Ozalp et. al (2022), McKinsey (2023), and Parker et. al (2016), highly regulated industries such as the healthcare sector are lagging behind when it comes to digital transformation (Ozalp et. al, 2022; McKinsey, 2023). According to a survey con-

ducted by McKinsey, comparing nine different industries based on their level of digitization, the healthcare industry was ranked second to last (McKinsey, 2023). Nevertheless, a certain shift toward digitalization has recently been identified (Ozalp et. al, 2022).

2.3.1 Why is the Healthcare Industry lagging behind Digital Transformation?

Not only tight regulatory restrictions but also other factors such as data privacy concerns and information asymmetries influenced the progress of digital transformation in healthcare. These challenges will be further explained in the following paragraphs.

One of the main reasons for the delay in digital transformation are the strict regulations in the healthcare sector (Ozalp et. al, 2022; Parker et. al, 2016). The industry is strongly affected by governmental and state actors, as healthcare has a significant impact on social welfare and the economic development of a country. The industry is impacted “in terms of access, fairness, equality, privacy, and data sensitivity, as these factors directly tie to human and constitutional rights.” (Ozalp et. al, 2022, p.83). The risk of the abuse of sensitive personal data or data leakage could lead to critical harm for individuals, which increases the need for tight regulations even more. Consequently, high entry barriers exist in combination with significant compliance expenditure, which make it more difficult for private organizations to embark on the industry (Ozalp et. al, 2022).

Another challenge faced by the healthcare industry is the increased need for data privacy. For new digital market entrants, it is essential to create their platform and its offerings based on data. However, due to high industry regulations, it is even more difficult to access data and convert it into valuable output. The significance of data privacy not only poses a challenge for new entrants, but also for incumbents. The majority of incumbents have not yet fully managed to exploit their existing data to enhance value creation by leveraging new technologies. The topic of data privacy points out the significance of defining rules for platforms on how to manage sensitive data (Ozalp et. al, 2022).

Furthermore, due to the complexity of healthcare organizations, multiple single-solution providers emerged. Even though they simplify the management of healthcare services, it also creates information silos, resulting in reduced knowledge sharing and diminished potential of innovation for organizations (Roland Berger, 2020; Kane et. al, 2015). Moreover, from a patient’s point of view, too many disparate services offered at

differing prices can cause confusion (Roland Berger, 2020). The created information asymmetry additionally highlights the importance of founding healthcare platforms with a connected ecosystem to improve health center management and the patient journey.

2.3.1.1 The Patient Journey

The patient journey is defined as the experience a patient perceives during a sequence of care activities, starting from the first point of contact with healthcare providers until the end of his/her treatment. Over the past years, healthcare providers commenced to view patients more like clients, hence started to focus on how the experience for patients can be upgraded to keep them as recurring customers. To get a clear comprehension of the patient's current experience, healthcare institutions apply the process of patient journey mapping, which allows them to identify areas for improvement. As a result, the patient journey can be tailored to individual requirements which leads to an overall enhancement of the experience. Both the patients and the healthcare providers benefit from this enhancement. For example, the adjusted journey can lower the typical duration to make a diagnosis, and herewith reduce the costs of this process (Definitive Healthcare, n.d.).

2.3.2 The Healthcare Industry's Potential to Implement Digital Strategies

According to McKinsey's Research (2023), there is high potential to implement digital solutions in healthcare based on three key pillars:

- Patients desire improved access to healthcare through digital services
- High value can be created by implementing digital strategies
- Existing players already offer innovative solutions successfully

With the evolution of technology, there is no doubt that the value chain of healthcare institutions will be disrupted (Capgemini, 2021) and herewith help to closely link the patient's needs (for example, simple access to high-quality healthcare, information access, transparency) with the requirements from healthcare providers (for example, overcome workforce shortage, reduce extensive administrative tasks). This value chain contains the prevention of diseases through user data analysis, improved diagnosis

with the help of AI technologies and treatment methods such as digital and remote surgery. Lastly, it enhances health center management by reducing information silos and ultimately optimizes patient experience (Capgemini, 2021; Binci et. al, 2022).

Based on a study by Roland Berger in 2020, improved patient experience is the most significant aspect of a successful implementation of healthcare platforms. Zenooz & Fox (2019) also highlight the importance of developing and closely managing patient relationships to create a unique patient journey. Platforms that build an interconnected ecosystem support healthcare providers in creating a 360-view of their patients by removing information silos. As a result, health services can be designed more efficiently and herewith enhance their quality, while patients profit from simplified access to these services (McKinsey, 2023; Zenooz & Fox, 2019). Moreover, by encouraging collaboration among the different players in the healthcare ecosystem, resources can be allocated more efficiently. As a result, the systematic problem in healthcare of not having enough healthcare providers available can be tackled (Bush & Fox, 2016).

From a patient's point of view, the offer of telemedicine and e-pharmacy services are the foundation for creating an upgraded patient experience and can therefore be regarded as the driving force of digitalization in healthcare. It strengthens the proximity between providers of health services and their patients (Roland Berger, 2020; Binci et. al, 2022).

2.3.3 Major Drivers of Digital Transformation in Healthcare

As discussed in the previous section, the continuous progress made in technological development significantly impacts patients' requirements. This influences healthcare institutions to rethink their organizational setup and pushes them towards platform models and the creation of co-dependent ecosystems (McKinsey, 2023).

Nonetheless, not only technological advancements played an important role in advancing digital transformation, but also the COVID-19 pandemic. The pandemic is seen as one of the most recent major drivers for digitalization in the healthcare industry. It significantly impacted the rise of digital platforms as a reaction to the changing consumer habits, and their increased need for digital health services (Capgemini, 2021; Roland Berger, 2020; McKinsey, 2023; Ozalp et. al, 2022). Patients were suddenly less re-

luctant to digital services such as online booking of doctor's appointments or online consultations, which before the pandemic was rarely used. Generally, with these new and innovative services, patients were looking for an overall improvement in their customer experience. It can be concluded that healthcare businesses realized the urgency to adjust their abilities in order to remain successful in meeting their patient's needs (Capgemini, 2021).

Furthermore, the COVID-19 pandemic has put increased pressure on governments to react to the precarious health situation quickly. Consequently, in Europe, regulatory restrictions have been adjusted. Due to these regulatory adherences, market entry barriers were lowered and new opportunities for healthcare organizations were created to develop digital health services (McKinsey, 2023).

Finally, big tech companies have had an influence on the digital development in the healthcare sector (Roland Berger, 2020; McKinsey, 2023; Ozalp et. al, 2022). Usually, big tech companies do not enter the market by providing healthcare services to patients from the start. They follow a different path by adhering to the industry dynamics throughout a period of time and evolving into exclusive providers of data analysis to create value. Big tech firms enter the market through partnerships with incumbents while providing them with data infrastructure for an improved data management of healthcare organizations. Combining their own collected data (for example, from smart watches) with indirect data gained through the partnership (for example, from previously obtained hospital data), allows them to create highly valuable analysis. This gained industry knowledge is not only relevant for incumbents, but it also enables tech firms to develop their own health services, to the extent where they might even compete with previous customers in the future (Ozalp et. al, 2022).

To summarize, while providers of healthcare services "own" the patients, big tech firms have an advantage in preventive care (Roland Berger, 2020). In addition to the major strengths of tech companies, also a large number of start-up businesses are on the rise. Start-up firms in e-health offer services to increase digitization and automation of healthcare businesses, leading to higher efficiency in procedures (McKinsey, 2023).

2.3.4 Type of Existing Healthcare Platforms

A high variety of digital healthcare platforms already exist. According to Roland Berger's Research (2020), they can be divided into four different types: Pure Data, Horizontal Integration, Vertical Integration, and Integrated Meta-Platform.

Pure Data Platform: Such platforms gather an immense quantity of data in order to generate value. Big data analysis allows those platform businesses to make better diagnoses, develop individual treatment plans, and overall contribute to an improved patient experience.

Platform with Horizontal Integration: These platforms normally concentrate on particular diseases, for example diabetes or cancer, and aim to aid their customers throughout the patient journey of their treatment. The platform can provide the patient with specific information about each stage of his treatment, or give recommendations for general health enhancements.

Platform with Vertical Integration: Different stages of the patient journey are targeted by vertically integrated platforms. Their goal is to encourage and strengthen cooperation among participants of the healthcare value chain across diverse indications. An example for this kind of platform are firms that allow online booking for doctor's appointments by directly linking patients and doctors.

Integrated Meta-Platform: They perform on a wider range compared to the other platform types, by integrating and connecting the majority of players of a particular healthcare system. They are not only vertically, but also horizontally integrated. In addition, they gather and analyze the data collected from various participating players. Their goal is to improve the efficiency of that healthcare system, and at the same time increase the experience of all patients in it.

The creation and implementation of such health care platforms bring up new technical challenges for the industry and its stakeholders. Users need to adapt to new tools to be able to utilize it effectively. Additionally, digital tools can be subject to technical failures, such as system crashes or connectivity issues, which might end up in delayed care or other treatment issues. Even though digital health technologies can contribute to decreasing healthcare costs in the long run, significant upfront costs might arise when implementing and maintaining the required infrastructure and technology. But one of the

main challenges is to ensure secure data storage and exchange. Privacy concerns are crucial factors that must be considered when creating digital healthcare platforms (Sanchez-Iborra & Skarmeta, 2022). According to Choun and Petre (2022), people tend to be less risk-averse when sharing personal data online, for example via social media. Nevertheless, when it comes to personal health data, they are more reluctant to have their data recorded, even in a highly protected system. Four crucial factors need to be met for patients to feel comfortable to disclose their health data:

- Patients need to trust that their health data is managed responsibly and privacy is ensured. Transparency about data collection, storage, and usage is necessary.
- Patients want control over their data, so that they are able to access, edit and delete them at any time if required.
- The benefits of sharing their data, like obtaining better healthcare outcomes or personalized treatments, must be visible to patients.
- The data sharing should be designed in a convenient way, enabled through user-friendly platforms and tools.

It can be concluded that the existing types of healthcare platforms target different customer groups. Nevertheless, all of them face similar challenges which need to be overcome to develop a digital healthcare organization. Building trust to their patients and other stakeholders is a vital factor to pursue, as data privacy is key for a digital healthcare business to be successful.

2.3.5 Digital Healthcare Ecosystems

The digital healthcare ecosystem is described as a comprehensive system of healthcare providers, organizations, and platforms, that offer patients healthcare services in an efficient and effective way. The core of a digital healthcare ecosystem is the connection of its stakeholders, such as healthcare providers, health organizations, and patients with the help of technology. It aims to eliminate silo solutions by linking all players and their offered services within the ecosystem to foster efficient collaboration (Witte, 2020).

Overall, a digital healthcare ecosystem is a system that integrates digital technologies and platforms to provide a seamless and efficient experience for all stakeholders involved. Building such an ecosystem requires collaboration, innovation, and a deep understanding of the health industry's landscape. By leveraging technology to bring together different stakeholders, digital healthcare ecosystems have the potential to transform healthcare delivery and improve patient outcomes.

Digital healthcare ecosystems bring vital advantages to their stakeholders. Not only can it enhance the relationship between doctors and patients, but also improves communication and collaboration among players in the ecosystem which cover different stages of the patient journey (Sanchez-Iborra & Skarmeta, 2022). Additionally, it enables patients to gain control over their health care (Ling, 2016).

The healthcare industry faces various challenges due to the rising demand for healthcare services. One of these challenges is sharing information between different healthcare information systems that may be incompatible. To address this issue, digital healthcare ecosystems opt to offer a steady treatment process that necessitates smooth information sharing across its players (Janjua, 2009). Furthermore, their goal is to provide care at the right time, place, and in the right manner. Herewith, digital healthcare ecosystems can support the development of a thriving eHealth environment (Benedict & Schlieter, 2015).

To sum up, building digital healthcare ecosystems is the direction the healthcare industry is moving to. Even though multiple challenges are faced that must be overcome, it brings many benefits to all its players once created successfully.

3 Methodology

The following chapter outlines the applied methods to obtain relevant information in order to answer the research question of this thesis. Multiple research options exist to gather all required details. For this thesis, an in-depth literature review has been done first to obtain an understanding of the principles of digital transformation, digital platform businesses, and digitalization in healthcare. These principles built the foundation of the theoretical framework.

In the second step, qualitative research has been conducted via semi-structured interviews to acquire valuable business insights about how digital transformation has impacted the healthcare industry, and how healthcare organizations react to it to simplify access to healthcare for patients.

3.1 Qualitative Research

Qualitative research focuses on exploring and understanding experiences, perspectives, and behaviors in a particular context. As opposed to quantitative research, this form of research normally uses a smaller sample size and puts a higher emphasis on the researcher's interpretation of the data. Qualitative research is a flexible methodology that allows researchers to adapt to new information and gain a deeper understanding of the context. It involves collecting and analyzing non-numerical data, for example through interviews or observations, to gain valuable business insights (Bell et. al, 2022).

3.1.1 Semi-Structured Interviews

According to Bernard (2006), there are four types of interviews: informal interviewing, unstructured interviewing, semi-structured interviewing, and structured interviewing. They are distinct from one another in the amount of control the interviewer exercises over the interviewee and the kind of data the interviewer tries to extract. For this thesis, the semi-structured interview method was applied to obtain crucial data about the digitalization of the healthcare sector in Europe.

Semi-structured interviewing is the most suitable interview method if there is only one chance to meet someone for an interview. It systematically follows a series of pre-defined questions, however, also allows enough flexibility to cater to the specific needs

and environment of the company. A general script helps to keep control over the process of the interview and ensures to cover all relevant subjects during the conversation (Bernard, 2006).

To analyze and evaluate the answers to the interviews in a structured manner, every question is linked to one of the research questions and based on a statement or thesis found in the literature review. This connection is vital to understand why the interview question is important and justified by the theory. All interview questions have been formulated in the following format as depicted in Table 1. The complete questionnaire for the interviews can be found in Appendix B.

Table 1: Format of Interview Questions

Question	To which research question is it linked?	Why is it important? (Statement in literature)	Foundation in literature (author)
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3.1.2 Data Collection

Semi-structured interviews have been conducted to gain valuable inputs from healthcare organizations which already implemented digital services, or are in the process of developing a platform business to improve patient experience by simplifying access to healthcare. Additional industry experts from the consulting sector have been interviewed to obtain further information on the topic from a different perspective.

The following table describes the chosen interview partner, the reason for the choice, and when the interviews took place.

Table 2: Choice of Interview Partner

Interviewed Experts	Reason	Date of Interview	Length of Interview
Interviewee 1 Business Development and Commercial Lead of a healthcare company	The firm has been chosen to understand what has driven the founders to create a tech-enabled	8 th March 2023	40 min

<p>which is currently developing a new hybrid healthcare platform business in Austria.</p>	<p>healthcare company, and observe the process of development as well as what resources are required.</p>		
<p>Interviewee 2</p> <p>Founder of a practice group recently founded in Switzerland, with the aim to modernize doctor's offices through additional digital services.</p>	<p>This healthcare organization was selected to understand the process of implementing new digital services into an existing business model.</p>	<p>8th March 2023</p>	<p>60 min</p>
<p>Interviewee 3</p> <p>Partner at an international consulting company, specialized on digitalization in healthcare and the creation of digital healthcare ecosystems in Europe.</p>	<p>In order to better understand digital trends and patient needs in the healthcare industry in Europe, this interview partner has been chosen.</p>	<p>22nd March 2023</p>	<p>30 min</p>
<p>Interviewee 4</p> <p>Senior Consultant at an international consulting company and PHD student specialized in digital healthcare applications in Germany.</p>	<p>This expert was interviewed to obtain industry insights about digital healthcare services and ecosystems.</p>	<p>13th March 2023</p>	<p>50 min</p>
<p>Interviewee 5</p> <p>Industry expert who worked for several years in the healthcare sector to advocate digitalization in Swiss hospitals, and is now employed as Digital Promoter / Business Analyst – Business Transformation & Customer Experience Management.</p>	<p>This interview partner has been chosen to obtain the hospital perspective on digital healthcare platforms, and to better understand the digital strategy development of a hospital.</p>	<p>29th March 2023</p>	<p>40 min</p>

<p>Interviewee 6</p> <p>Head of German Switzerland of a digital platform business which enables online booking of doctor's appointments and teleconsultation in Switzerland.</p>	<p>This firm is one of the leading online platforms in the e-health sector. It contributes to accelerate digitalization in healthcare, and highlights the importance of digital services to healthcare organizations.</p>	<p>15th March 2023</p>	<p>60 min</p>
<p>Interviewee 7</p> <p>Sales Strategy Analyst of a digital platform business which enables online booking of doctor's appointments and teleconsultation in Europe.</p>	<p>The digital healthcare platform belongs to the leading firms in Europe. It was selected to gain insights about their core business, their positive impact on other healthcare organizations, and the patient journey.</p>	<p>28th March 2023</p>	<p>40 min</p>
<p>Interviewee 8</p> <p>Product Analyst of a digital healthcare company from Sweden which facilitates accessibility of medical services to patients in Europe.</p>	<p>The firm was chosen to better understand what services they provide in order to improve accessibility to all patients through a digital platform.</p>	<p>28th March 2023</p>	<p>60 min</p>

3.1.3 Analysis of Interviews

It is stated by (Saunders, Lewis, & Thornhill, 2009), that the collected data must be integrated and classified for a valuable analysis of the interviews. Designing a conceptual framework either in advance of, throughout, or subsequently to the interview conduction supports the evaluation.

The theory which serves as the basis for the interview analysis in this thesis comes from the grounded theory by Sociologists Barney Glaser and Anselm Strauss in 1965. The grounded theory is founded on collecting and analyzing data, and identifying patterns to derive a new theory. No hypothesis is needed for this research method. It is a cyclical process, where data analysis and collection happen iteratively. In order to analyze the interviews, the data needs to be coded. It will be coded in three different steps named open coding, axial coding, and selective coding. Those coding types will be explained in the next sections (Sebastian, 2019).

3.1.3.1 Open Coding

The interview analysis starts with creating open codes. This process is a perpetual comparison between different groups of data to slowly group and structure them. By comparing statements from the different interview responses, connections but also contradictions can be identified. Based on this comparison, open codes can be developed (Sebastian, 2019).

3.1.3.2 Axial Coding

The second step in the interview analysis is called axial coding. In this process, the different codes, which were created before, are compared with each other to identify categories that connect them. In other words, codes are rearranged and grouped into categories (Sebastian, 2019).

3.1.3.3 Selective Coding

The last step in the interview analysis aims to identify core categories, which become the basis for the final theory. Once more, a comparison needs to be made to develop core categories, but this time by comparing and connecting the categories created in the axial coding (Sebastian, 2019).

Once the core categories have been defined, a new theory could be developed. The theory should be formulated in a short statement and then be described in more detail. The main points stated in the theory should be backed up with the coded data for validation.

4 Findings

In the previous chapters, the theoretical foundations have been laid out. In the second step, eight expert interviews have been conducted to gather valuable industry insights. Different types of healthcare companies have been interviewed, from digital platforms to organizations that follow a hybrid business model, which offer digital services but also have physical locations to provide health services. Moreover, three additional industry experts from the consulting industry and the digital transformation team of a hospital were interviewed. By following the open, axial, and selective coding process, two new theories have been derived. The key findings of the interview analysis as well as the theories are presented in the following section.

4.1 Interview Analysis

The evolving technology is impacting the digitalization in the healthcare industry. More and more digital healthcare platforms were developed to facilitate access to healthcare services, improve the quality of treatments for patients, and simultaneously enhance the efficiency of healthcare organizations. Many factors led to the increased importance and acceleration of digital transformation in the healthcare sector. Two important factors were the COVID-19 pandemic and the regulatory changes.

The pandemic has been a crucial driver to transform the healthcare industry, as suddenly everyone was forced to use digital tools. Certain services such as teleconsultation already existed before but were rarely used. Due to the given circumstances during the pandemic, their popularity increased substantially. Healthcare organizations realized the potential of digital tools and started to work on extending their digital services to cover more steps in the patient journey that are connected to online consultation, such as online medication prescription.

Since the healthcare industry is a highly restricted market, many challenges were faced in the development of new services and slowed down the digital transformation process. However, the pandemic has put pressure on the government which ultimately lead to regulatory changes in the industry. An example is the adjustment of volume restriction for teleconsultation per healthcare provider or per type of service provided remotely. These changes reduced barriers to implementing a wider range of digital services.

Nevertheless, tight restrictions are still common in the healthcare sector, especially in regard to data privacy. These challenges, as well as the benefits digital platforms have to offer, have been captured and are further discussed in the two newly developed theories. Both theories will be explained in detail based on the associated axial codes. Figure 4 shows an overview of all the codes that were created during the interview analysis.

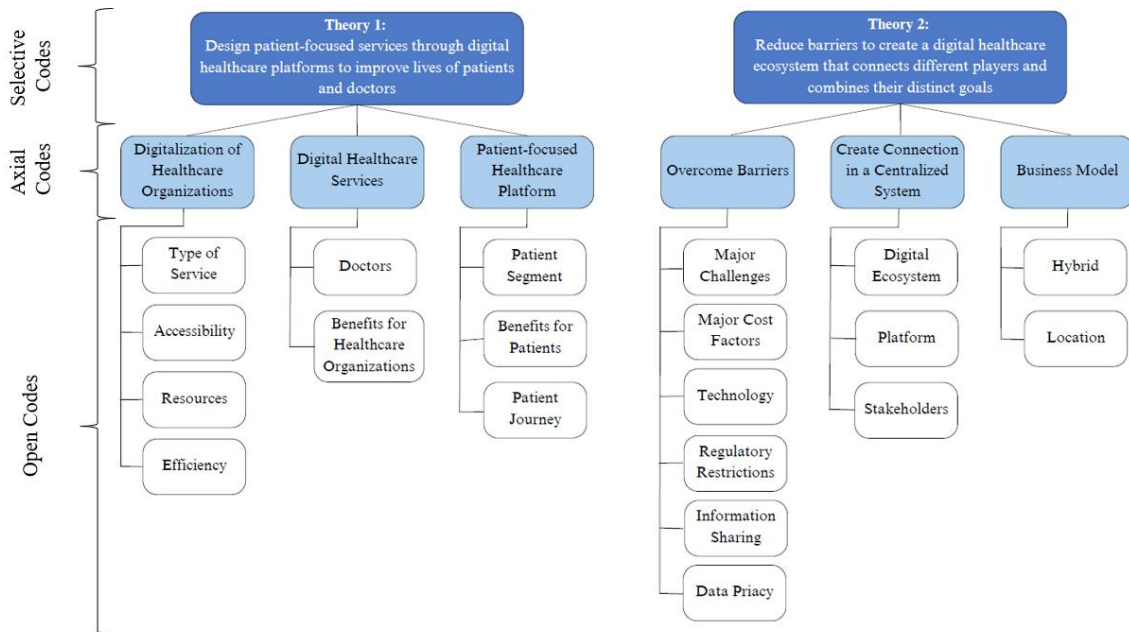


Figure 4: Coding Tree (source: own illustration)

4.1.1 Theory 1

In the axial coding process, three categories were created which led to the development of Theory 1, “design patient-focused services through digital healthcare platforms to improve lives of patients and doctors”. The three categories called “Digital Healthcare Services”, “Digitalization of Healthcare Organizations”, and “Patient-Focused Healthcare Platforms” are described to explain the first theory in more detail.

4.1.1.1 Digital Healthcare Services

A wide range of digital healthcare services already exist, which are offered by healthcare organizations through their digital platforms. Based on the interviewed companies, the most common services used are teleconsultation, electronic prescription (e-recipe), online appointment booking, online chat function for immediate consultation,

specialist referral service, online billing, and patient document sharing. The latter is still a controversial topic. A standardized electronic patient file has not been developed yet in all European countries as it faces multiple challenges such as tight regulatory restrictions and data privacy concerns. The topic of data security will be further discussed in Theory 2.

Despite the type of service, it is crucial to design them user-friendly and make access as convenient as possible for patients and healthcare providers. According to Interviewee 8, visualizing complex topics and processes in a simple way is very challenging. *“Patients compare digital healthcare services and applications with normal apps that they use every day, which are two very different things. But they expect it to work as simply as all the others. It is important to assess to what extent the platform can be gamified, but still appear serious and trustworthy.”* To achieve this, healthcare organizations work together with doctors and patients to better understand their needs and develop new services or adjust existing ones based on their input. Another important aspect of this decision-making process is data analysis. Through digital platforms, more information is accessible, hence more data can be collected and is available for tracking. These analyses help to measure the effectiveness of existing digital services and contribute to improved quality of treatments.

Even though healthcare providers analyze the patient journey in detail and claim they want to cover it seamlessly with end-to-end digitalization, digital services are generally still considered as complementary services only. Depending on the case, it will not be possible to treat a patient fully online. The physical connection is still required, and a real doctor’s validation for a diagnosis and treatment plan will remain necessary.

4.1.1.2 Digitalization of Healthcare Organizations

All Interviewees agreed that by integrating new technologies and tools, the efficiency of a healthcare organization could be significantly increased. It not only allows them to eliminate time-consuming, manual work to focus on more value-adding tasks but can also save costs. Moreover, through the automation of their internal processes (such as appointment management through online booking systems), healthcare providers have more time for their patients. This positively impacts the number of patients they can treat in the same amount of time, or leave them with more time for individual patients to build up a stronger relationship and provide them with high-quality services.

When offering digital services, such as teleconsulting via digital platforms, healthcare providers can get a higher reach and increase their visibility through online presence and herewith attract new patients. However, the opportunity to increase the patient base varies from doctor to doctor. It is more interesting for specialists (for example dermatologists), as general practitioners on average already have a large client base and often face high workload. This points out the problem of workforce shortage in healthcare. Nevertheless, the interviewed industry experts stated that this issue can also be tackled with the help of digital platforms, as they significantly improve information-sharing and communication within a healthcare organization. As a result, processes are optimized, and resources can be allocated more efficiently.

Similar to other industries, Interviewee 8 pointed out that the employees in the healthcare sector are also longing for more flexibility in their work schedules. Providing services via a platform such as teleconsultation or instant messaging allows doctors to work remotely, or work more flexible hours, which was unimaginable before digitalization. As a result, healthcare organizations become more attractive employers when offering digital services via an online platform, and at the same time, they can address new employee expectations.

4.1.1.3 Patient-Focused Healthcare Platforms

Even though there are different reasons why patients decide to use digital platforms for their own health management, those platforms are not restricted to specific patient segments. Younger patients like to use digital platforms as they can obtain the required information or a solution for their treatment quickly and easily. On the other hand, for families, the focus might be to manage the health data of their children independently (for example to check when the next vaccine is due), centralized on one platform, that helps them to keep track without direct interaction with a healthcare provider. However, no matter what the intention of using the platform might be, it is always important to offer patients user-friendly, easily understandable services in the most convenient way.

As older people tend to be less familiar with digital tools, but at the same time request more health services compared to younger generations, it is even more important to develop user-friendly online platforms. Nevertheless, our population is aging, resulting in more people eventually needing medical services. By offering online services on digital platforms, the increased demand can be better managed.

Another important factor for patients to use digital healthcare platforms is that access barriers to obtaining healthcare services are lowered. First of all, it provides access to patients with limited mobility. Moreover, five out of eight from the interviewed industry experts highlighted the fact that digital platforms simplify access for patients living in more rural areas, where receiving healthcare is usually more difficult due to a limited number of doctors available. Additionally, the issue of the so-called “medical desert” can be tackled. The medical desert refers to a healthcare system with an inadequate number of patients and doctors available in a certain region. By offering digital healthcare services such as teleconsultation, more doctors are available as the proximity factor of doctor and patient can be neglected. Furthermore, accessing health services online provides patients with anonymity. This is especially valid in cases where patients might feel ashamed to get help, for example in case of mental health issues or for STD treatments.

Furthermore, an increasing number of patients seek information to educate themselves about healthcare topics online. However, they do not only want to see facts but also have quick access to solutions depending on their issues. *“It is essential to create digital platforms which enable access to the required information, and directly link patients with the online service to provide them for example with an online treatment plan or connect them to a specific doctor via an online booking tool”*, as stated by Interviewee 3.

To sum up Theory 1, healthcare organizations need to design patient-focused services offered on digital healthcare platforms to improve the lives of patients and doctors. The provided services must be of high quality and easily accessible by creating user-friendly tools that meet patient expectations. The ultimate goal is to increase the efficiency of organizations, the effectiveness of their digital services, and thereby provide better treatment to patients while also offering increased flexibility to healthcare providers.

4.1.2 Theory 2

Theory number 2 has been derived based on the axial codes “Overcome Barriers”, “Create Connection in a Centralized System”, and “Business Model”. The development of Theory 2, “reduce barriers to create a digital healthcare ecosystem that connects different players and combines their distinct goals” is outlined in the following paragraphs.

4.1.2.1 Overcome Barriers

From a technical point of view, different aspects are considered as critical barriers for accelerating digital transformation at a healthcare organization and the development of digital platforms.

The main technological issues of healthcare organizations are their so-called legacy systems, which are outdated IT systems. They are too old to connect with newer software, hence making it complicated to implement new features and digital services, or to create a digital platform. To make the connection possible, the whole IT system needs to be replaced, which is time-consuming and involves a long-term strategy, as it affects the whole organization.

Another issue is that lots of manual processes exist. *“Certain medical practices still work with a physical agenda instead of managing patient appointments on a computer”*, as indicated by Interviewee 7. To transform such manual processes into digital ones, all existing information first needs to be digitized before it can be integrated into digital workflows.

Many different systems and software already exist. Even within one single healthcare organization, multiple software is used. It is difficult to connect them because often they are not compatible due to different data structures, which makes it challenging to combine them. This is one of the reasons why the healthcare system is fragmented. It is essential to break down information silos to facilitate the creation of digital platforms. As a result, it allows healthcare organizations to store and manage information in a centralized place, and herewith improve communication within the organization.

It can be stated that the overall risk of shifting to a digital healthcare platform is that the healthcare organization might become too dependent on technology. What happens if the system crashes, or in case of bugs in the software? How can the processes continue to run smoothly and data remain secure and accessible? It is advised by the industry experts to address and manage these risks already in the business strategy formulation and the design of the platform.

Technological aspects are not the only challenges that healthcare organizations face when building a digital platform. There are also important points to consider from the patient’s point of view. In regards to this topic, the most mentioned challenge was to

build trust for patients. It is difficult to make that shift in the patient's mindset from using purely physical services with face-to-face interaction towards digital interactions. Therefore, it is essential to ensure high quality of the services offered online to build trust and attract more patients to use online healthcare services.

The next issue connected to patients' trust are privacy concerns. Patients are not willing to share and store their personal health data online. To overcome this trust issue, platform providers need to ensure high security and privacy standards in alignment with the regulatory guidelines of their country and GDPR (General Data Protection Regulation in Europe). It is an essential prerequisite for the development of electronic health records (EHR), which currently is a much-debated topic in the healthcare industry. An EHR is the patient's medical history that is digitally stored. As a result, it can be shared across different stakeholders in the healthcare system. Creating and integrating EHR will additionally help to remove information silos and increase efficiency of healthcare organizations through improved communication.

Regarding the cost structures, all interview partners agreed that the main cost factor of a digital transformation and the development of digital healthcare platforms are people. Tech-savvy talents are required to create the platform and to design and implement complex services in a user-friendly way.

4.1.2.2 Business Model

Healthcare organizations follow different business models. Based on the interviews, three different types were identified: Fully digital organizations, traditional organizations without any digital services, and hybrid organizations which complement their physical services with digital platforms. It can be stated that the business model of traditional healthcare organizations with solely physical services is outdated and will move to a hybrid model in the future. Physical practices remain necessary, but organizations should aim to digitalize as much as possible of the patient journey. To do so, it was claimed that new standardized regulations are required to create a centralized system. Currently, each country as well as each region within a specific country follows different rules and regulations in the healthcare sector. Creating a centralized system according to standardized regulations will facilitate the rollout of digitalization projects and the creation of central healthcare platforms.

4.1.2.3 Create Connection in a Centralized System

As described before, there is a need to standardize processes and centralize information. Digital platforms would help to link the different players in the healthcare system, resulting in a closely connected system as a whole. To create such an interconnected system, not only trust from patients in the platform is required, but also from all other stakeholders. According to the interviews, healthcare organizations (such as clinics, hospitals, or medical offices), doctors, patients, health insurances, and pharmacies have been identified as the main stakeholders in the healthcare ecosystem.

Two main challenges are faced when creating a platform that combines all stakeholders to cover an end-to-end patient journey. First of all, each stakeholder in the healthcare system has different goals. Interviewee 2 remarked that *“patients do not want to go to specialists to get surgery for as long as possible if it is not necessary, while hospitals and specialists want to increase their referral rate to increase the number of surgeries, and pharmacies want to sell as many products as possible to increase their revenues.”* A platform must offer benefits to all its players to be an attractive opportunity of which they want to make use of.

The next crucial question is, who will be the main provider of this platform that connects all stakeholders? The organization that can prevail must have the right company culture, a proper vision, and the required talents to create the platform. Nevertheless, the interviewed industry experts agreed that one single platform that combines the whole industry within one country and covers an end-to-end patient journey is rather unrealistic. Next to the challenge of addressing all different intentions of the players, the provider of the main platform will be extremely powerful. Furthermore, it should not be the goal of an organization to do everything by itself. Therefore, the expert's answers on how to create an interconnected healthcare industry are through digital ecosystems rather than one digital platform. The optimal scenario is to encourage cooperation, build partnerships, and thereby profit from each other.

To summarize theory 2, it is essential to break down industry barriers to build a network of trust and encourage cooperation among the different players in the healthcare system, which ideally results in close partnerships. To achieve that, an interconnected

digital healthcare ecosystem must be created. A precondition to create a centralized system is increased standardization through regulatory frameworks in regard to data privacy and information sharing.

5 Discussion

In the following subchapters, the three research questions of this thesis will be answered in detail by linking the key findings with the theoretical framework. Furthermore, it will be discussed if the healthcare system can be improved through one platform which combines the whole patient journey based on the two developed theories in the interview analysis.

5.1 Research Question 1: What are the key drivers that push the healthcare sector in Europe to transform into a more patient-focused industry?

Multiple factors were identified that disrupted the healthcare industry and led to a shift in the structure of healthcare organizations. The key drivers responsible for transforming the healthcare sector into a more patient-focused industry are discussed in the following paragraphs.

Similar to other business sectors, such as the travel or hospitality industry, advances in technology opened up new possibilities for organizations in healthcare. The implementation of technology enabled healthcare organizations to develop new services based on the changing patients' needs and behaviors. Due to more options offered online in other industries, clients of healthcare organizations have the same expectations of the healthcare industry. They prefer online services which are easily accessible and convenient to use.

This led to the development of digital healthcare platforms, specifically designed to meet the new demands of patients, and herewith facilitate closer patient engagement. In addition, patients are more demanding and want to be able to inform themselves when it comes to their health, as learned through the conducted interviews. Patients want to be more involved in decisions about their healthcare. Also, they expect healthcare providers to listen to their needs and preferences to build new or complementary health services offered online. The importance of an improved patient experience is also confirmed by the study from Roland Berger (2020) as well as the cited article by Binci et. al (2022) in chapter 2.3.2.

The next key driver was the COVID-19 pandemic. This driver was first identified in the theoretical framework and additionally verified by the interviewed industry experts. It forced the healthcare system to switch to making use of digital tools. According to Interviewee 6, it is important to point out that a few digital services such as teleconsulting existed before but were barely used. Healthcare organizations as well as patients realized during the pandemic how simple and convenient the usage is, and only then, due to external circumstances, increased rapidly in popularity. Suddenly, patients expected subsequent steps in the patient journey to be available in a digital form as well, to create a more efficient and satisfying patient experience. Therefore, healthcare organizations started to create more digital services such as electronic prescriptions, and implemented them on their digital platforms. It can be stated that the service of online consultation was one of the driving forces to accelerate digitalization in healthcare even further.

Another ripple effect of the COVID-19 pandemic was the regulatory changes. As described by Ozalp et. al (2022) and Parker et. al (2016) in the theoretical framework, the healthcare industry has to follow tight market restrictions, which make it difficult to transform the health sector in any way, digitally as well as more patient-focused. The pandemic pushed the legal system to adjust to make online services available for patients to receive their required treatment. A specific example mentioned by four out of eight interview partners is the change in volume restrictions for teleconsultation. As a result, more people could be treated online which leads to a higher number of satisfied patients.

To sum up, advances in technology, patient empowerment, the COVID-19 pandemic as well as regulatory changes were identified as key drivers to push the healthcare sector towards a more patient-focused industry, and to prioritize patient-centered care as a means of improving outcomes.

5.2 Research Question 2: How can healthcare organizations simplify access to patients with help of digital platforms?

The ultimate goal of a platform is to simplify transactions of all involved stakeholders, as stated by the theory of Parker et. al (2016) and Gawer (2022). One of the key success factors of implementing digital platforms is the improved patient experience (Roland Berger, 2020). Offering different online health services in one platform like teleconsultation, electronic prescription (e-recipe), online appointment booking, online chat

function for immediate consultation, specialist referral service, online billing, and patient document sharing significantly improve access and enhance patient engagement. Therefore, healthcare organizations are advised to create and combine their services in one integrated meta platform, which is a horizontally and vertically integrated platform to connect the majority of its players in one system (Roland Berger, 2020).

The creation of an interconnected platform will link the fragmented system and diminish information silos. Not only can it improve communication within or across healthcare organizations, which leads to higher service efficiency that also benefits patients, but it also reduces confusion among patients, as there are too many single-solution providers that make it hard to keep an overview of the system and its offerings. According to Interviewee 8, developing a platform that connects different players and services will serve as a simple entry portal for patients to receive their required treatment, regardless of their geographical location.

To create a connected system, it is essential to build trust between the different players. Especially patients must feel comfortable using digital services. During the interviews, it was pointed out that the tools need to be designed in a simple and attractive way, while also promising high quality to the patients in order to build trust. Additionally, patients should be in control of managing their own health data recorded on the platform, and the value of its usage should be highlighted. Choun and Petre (2022) argue that only by considering these conditions, trust between patients and the digital platforms can be built which leads to a successful and interdependent healthcare system.

Last but not least, patients increasingly make use of platforms to educate themselves. According to interview partner 5 this is a crucial factor. *“Currently, due to the workforce shortage, doctors don’t always have enough time to educate patients in detail, but the patient’s demand for education is increasing. There are lots of studies and publications available online about numerous healthcare topics. However, they are written in such a scientific language which is difficult to understand for everyone.”* Patients want to be able to find relevant information about healthcare quickly and in simple language. Simultaneously, they do not only look for information about a specific issue but also directly want to have a solution available. Therefore, it is important to have a platform that not only offers educational content that is easily understandable, but also has services available, for example, so the patient gets directly linked to a doctor via enabled online

appointment booking, and benefits from teleconsultation or offered treatment plans online.

By creating digital health platforms that connect different players in the system while also offering information for education and relevant treatment services, healthcare organizations can simplify their access to patients.

5.3 Research Question 3: What new value streams can healthcare organizations access by implementing digital platforms?

By combining the key findings from the interview analysis with information from the literature review, a business model canvas was created for an integrated meta-platform. The business model canvas can be found in Appendix D. Based on it, new value streams for healthcare organizations were identified.

The previous chapter already touched on the complexity of the healthcare sector, which is further fragmented through more and more single-solution providers online. This asymmetry of information puts more pressure on healthcare organizations to build an interconnected platform. Additionally, new customer needs created through technological advancements push organizations to extend their digital services. Mapping out the patient journey helps to identify where new digital tools can be integrated to offer complementary services. By generating more patient touchpoints, the aim to digitalize the patient journey end-to-end can be further pursued.

Not only new digital platform businesses should study the patient journey, but also healthcare organizations that follow a traditional business model and only offer physical services. Mapping out the patient journey enables firms to detect new revenue streams that can be accessed online, and improve patient engagement and satisfaction. This will lead traditional organizations to shift to a hybrid business model, meaning that they offer services not only physically but also online. However, according to the Interviewees, it is vital to keep in mind that the newly developed services need to be compared and aligned with the core business, as everything newly created needs to bring benefit to the organization and its main stakeholders. The biggest risk is to invest resources to develop a new service which in the end is not used by the patients.

As stated in the literature from Girdwichai (2020) and Stone (2019), offering online health services via a digital platform allows healthcare organizations to reach new patient segments and markets. Geographic market barriers can be reduced, and allow the connection of healthcare providers and patients in rural areas. The benefit of extending their services to rural areas was also highlighted by more than half of the interview partners. By entering new markets and acquiring new patients, higher profits can be generated and simultaneously also offer a benefit to more patients by facilitating access to healthcare.

Digital platforms enable healthcare organizations to manage their patient data more efficiently and securely. During the expert interviews, the topic of electronic health records (EHR) was named multiple times. The development of EHR could provide a comprehensive view of a patient's medical history that can also be shared with other stakeholders and the patient itself. Through this information sharing, transparency can be increased, and communication and collaboration between healthcare providers, patients, and other stakeholders within a system can be enhanced.

All interview partners were in agreement that the improved communication and collaboration enabled through digital platforms can help healthcare businesses streamline their operations and reduce administrative burdens, leading to increased efficiency. By automating routine tasks and reducing administrative burdens, costs for healthcare organizations can be reduced. The theory of enhanced efficiency through digital tools is also confirmed by Schwertner (2021) and Stone (2019).

Digital healthcare platforms can improve patient satisfaction by providing patients with greater convenience and access to healthcare services. Furthermore, the improved efficiency of organizations leaves healthcare providers with more time for their patients. A stronger doctor-patient relationship can be built, and better-quality treatments offered.

In conclusion, through the establishment of digital healthcare platforms four new value streams have been identified:

- New customer needs can be determined and addressed via online channels by mapping out the patient journey.

- Reaching new markets and patient segments allows organizations to increase their patient base resulting in higher revenues.
- Information sharing enhances communication and collaboration among stakeholders in the healthcare system.
- Automating routine tasks leads to more cost- and time-efficient operations.

This clearly shows that creating an online platform is an attractive and profitable opportunity for healthcare organizations in Europe.

It can be stated that platform thinking represents the essence of digital transformation in healthcare by leveraging new technologies and data availability to develop innovative services and increase profits. As a result, the ability of healthcare organizations to seamlessly integrate their services into a digital platform will become an important competitive advantage.

Nevertheless, the interview findings pointed out that one main platform, which integrates and connects all players in one healthcare system, is unlikely to be the answer to all issues in healthcare. The question remains if the healthcare system can be improved through one platform that combines the different stakeholders involved to cover the whole patient journey.

5.4 Does one singular healthcare platform within a system make sense?

While a single platform from one main provider combining the whole patient journey might have the potential to improve the healthcare system, the likelihood that one platform alone can solve all the challenges faced by the healthcare industry is rather low.

The complexity of the healthcare industry itself is one of the key challenges when trying to implement a single platform that covers the whole patient journey. The industry contains a wide range of stakeholders such as patients, healthcare organizations, and regulators, each with their own priorities and goals. Hence, it is challenging to develop one single platform that addresses and encompasses the needs of all of these stakeholders.

Moreover, the healthcare system is constantly evolving with the emergence of new technologies and new regulatory changes. One single platform might struggle to keep up with those adjustments and adapt to the evolving demands of patients and healthcare organizations.

That being said, implementing a digital platform that integrates various healthcare services and stakeholders is a step in the right direction. However, for a cohesive and sustainable improvement of the healthcare system, the cooperation of its multiple stakeholders is required. While a single platform might be beneficial, it is rather unlikely to be the ultimate solution for the fragmented healthcare industry.

Based on the theoretical framework of this thesis as well as theory 1 “design patient-focused services through digital healthcare platforms to improve lives of patients and doctors”, and theory 2 “reduce barriers to create a digital healthcare ecosystem that connects different players and combines their distinct goals” that were created in the interview analysis, it can be argued that healthcare organizations should opt to create digital platforms to offer patient-focused online services and improve access to their patients. However, it is unrealistic to cover the whole patient journey end-to-end for each treatment online with only one platform. Therefore, it is more important to encourage collaboration and the creation of partnerships within a system. As a result, an interconnected healthcare system can be developed by linking all different players from patients to doctors and healthcare organizations in a digital ecosystem.

It is out of the question that platform businesses will disrupt and reshape the health sector. However, digital platforms should not be standalone solutions but must become part of a digital ecosystem by integrating with other healthcare organizations. This statement is also confirmed by Reillier & Reillier (2017), who proclaim that a platform-powered ecosystem strategically links organizations with different business models, and encourages cooperation between them to improve the overall success of the system. By contributing to this ecosystem, patient outcomes can be improved, efficiency will be increased, collaboration enhanced, and innovation in the healthcare industry will be further accelerated.

6 Conclusion

The goal of this thesis was to examine the potential role digital platforms can play in the healthcare sector, and how they can contribute to improving the industry. Through this research, vital reasons were identified that were crucial in transforming the healthcare sector into a patient-centered industry. The COVID-19 pandemic and its related regulatory changes in the industry can be seen as triggers for this movement. Increased patient empowerment driven by new patient demands led to the development of novel services and business models, such as fully digital platforms, or hybrid business models which seek to combine physical and digital healthcare services.

To create a more patient-focused industry, access to healthcare should be simplified. Currently, patients seem to be confused by the many existing providers. Launching digital healthcare platforms which combine and offer a wide range of information to patients and directly connect them with healthcare professionals, allows patients to manage their own health better.

Not only do patients benefit from the rise of digital platforms, but also new revenue streams open up for healthcare organizations. Closely analyzing the patient journey helps to identify opportunities to extend online services, leading to a higher market reach and increased patient satisfaction. Moreover, enhanced communication as well as improved efficiency through the elimination of mundane tasks leads to higher productivity in an organization. Ultimately, healthcare professionals have more time for their patients to build meaningful relationships and provide them with high-quality treatments.

It can be concluded that different approaches toward a platform-powered ecosystem exist. New healthcare organizations emerge, which enter the industry on the digital path by following platform strategies. On one hand, certain organizations remain fully digital, while others extend their strategy by opening up physical practices to increase their presence and cover additional steps of the patient journey. On the other hand, there are traditional healthcare organizations that are slowly moving from solely physical practices to integrating digital services. Despite the different business strategies, there is a trend that shows that the healthcare sector is increasingly moving toward the integration of digital platforms.

Creating platforms that aim to cover an end-to-end patient journey is a first step towards breaking down information silos, which among others is regarded as one of the main issues in the healthcare industry. They aim to connect different players, encourage collaboration, and increase transparency through information sharing. Platforms are a starting point to transform the fragmented healthcare system into an interconnected industry. However, as learned through the interviews, it is difficult to only have one platform that combines the whole industry. There are too many barriers, from an IT standpoint over to the regulatory aspects, which differ not only between countries but also across regions within one country.

The ultimate goal is to create a closely connected healthcare system to offer simple access for patients to healthcare. The system should link all its players and provide them with benefits according to their different goals. This can be achieved by making use of technology and implementing new digital tools such as digital platforms. However, since it is unlikely that only one main platform provider can assert oneself within one system, the answer is to create a digital interconnected healthcare ecosystem. With the development of digital healthcare platforms which then get linked in a co-dependent ecosystem, the healthcare industry can be improved.

6.1 Limitations and Further Research

This thesis focused on the identification of the drivers and the need to create a connection between stakeholders with digital platforms. In future research, it would be interesting to analyze further how this connection can be built up. For example, by examining what kind of partnerships are necessary for an interconnected healthcare ecosystem, how the creation of those partnerships could be approached, and what conditions are necessary to enter successful partnerships.

The key findings of this thesis are limited based on the insights from the chosen interview partners. Industry experts from eight different companies from Switzerland, Austria, France, Italy, Germany, and Sweden were interviewed. Further business insights could be obtained by conducting additional expert interviews to gain more details about digital healthcare platforms and their impact on how to improve the healthcare industry.

The healthcare industry was analyzed from a holistic point of view and took into consideration multiple countries in Europe. Healthcare systems can vary from country to

country. Even though there are similarities in the structure of the industry and the challenges they are facing, each country has its own regulations and issues to deal with. Nevertheless, the findings of this thesis show that there are overlaps between the systems and that the digital path is one way to tackle those challenges, regardless of the geographic location.

To obtain a more in-depth understanding of the regulations in the healthcare industry in Europe, further research could also be conducted to analyze the legal aspects closely. It is advised to assess the laws in detail and how they can further impact the development of digital platforms in the healthcare sector. Especially the topic of data privacy should be further scrutinized, as it is one of the main challenges identified in this thesis to create an interconnected healthcare system. The recent development of AI technologies further emphasizes the importance of the topic of data privacy laws. AI systems show a high potential to revolutionize the industry by improving the accuracy, efficiency, and personalization of care through big data analysis. Therefore, in future research, it would be interesting to analyze what role AI plays in digital healthcare platforms.

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Appendices

Appendix A: Glossary

AI: Artificial Intelligence is the capability of machines to simulate human intelligence. With AI, systems or machines automatically learn and adjust to provide more precise responses. Machines can take decisions through pre-installed algorithms and efficient computing technologies.

Big Data Analysis: Big Data are databases that surpass the size of conventional data sets. It requires advanced methods to process and analyze the existing data. Big Data analysis is the procedure of analyzing and interpreting these complex data sets made out of structured, unstructured, and semi-structured data. By examining Big Data, patterns, trends, and other relevant insights can be obtained which are used for data-driven decision-making.

Digital Era: The digital era refers to the time period that started in the late 20th century with broad adoption of technology such as computers, smartphones, and the internet. The digital era continues until today by impacting people's lives and the way they work, communicate, or access information with digital tools.

Digital Maturity: The level of digital maturity indicates to what extent a company has efficiently integrated technology into its company strategy, structure, and operations. It is considered a key measurement of a company's ability to create value through digital tools. Digitally mature companies profit from advanced digital capabilities to enhance their efficiency and innovation.

EHR: Electronic health records are patient's health information such as their medical history, diagnoses, or lab results stored in a digital format. It facilitates simple access to a patient's health record and enables improved communication and coordination among different healthcare providers.

e-health: Digital health is referred to as e-health, which is the application of digital tools in healthcare to enhance the quality, efficiency, and accessibility of healthcare services. Telemedicine, mobile health apps (mHealth), and electronic health records (EHR) are only a few examples of the many existing applications.

e-pharmacy: E-pharmacies are also called online pharmacies which simplify access to healthcare products for patients. They are digital platforms that enable customers to buy over-the-counter medication or drugs by uploading their prescriptions online. The ordered medication will be directly delivered to the patient's home.

Incumbent: In a business context, an incumbent generally is a company or organization which possesses the majority of market share within a specific industry.

Telemedicine: It is defined as the practice of providing healthcare services remotely, such as video consultation, by using advanced technology. It enables patient consultation with healthcare providers without the need to physically visit a medical facility.

Appendix B: Interview Questionnaires

Questionnaire for Healthcare Companies

Question	To which research question is it linked?	Why is this important? Statement in literature	Foundation in literature (author)
Could you please provide me an overview and quick introduction of your company?	How can the healthcare industry simplify access to patients with help of digital platforms?	Definition of a platform business;	Reillier & Reillier (2017); Gawer (2022); Parker et al (2016)
what is your company's vision and mission?	What are the drivers that push the healthcare sector to transform into a more patient-focused industry?	Major drivers of digitalisation in healthcare; Healthcare industry's potential	Roland Berger (2020); McKinsey (2023); Ozalp et. al (2022); Capgemini (2021)
What services do you offer your patients/clients? And what resources are required to offer these services?	How can the healthcare industry simplify access to patients with help of digital platforms?	Digital health care ecosystems; Existing health care platforms; The patient journey; Business model canvas	Sanchez-Iborra and Skarmeta (2022); Roland Berger (2020); Definitive Health care (n.d.); Reillier & Reillier (2017)
Are doctors/patients involved when new services are developed?	How can the healthcare industry simplify access to patients with help of digital platforms?	How to build a digital platform; The rocket model	Reillier & Reillier (2017)
What advantages do digital platforms offer its patients and the healthcare organisations (compared to traditional doctor's offices) ?	What are the benefits of implementing such platforms for healthcare businesses?	Competitive advantages for companies; Increase value through data analysis; Cost efficient; Network effect; Facilitate access for patients	Gawer (2022); Ozalp et. al (2022); Reillier & Reillier (2017); Stone (2019)
What are the biggest challenges of a digital healthcare platform?	What are the benefits of implementing such platforms for healthcare businesses?	Rocket model; Challenges of digital transformation for organizations; Higher competition; Too many competing project priorities within a company; Skilled workforce	Reillier & Reillier (2017); Stone (2019); Aagard (2019); Matt et al (2015); Kane et al (2015)
How do you plan to improve patient's access to healthcare services? Why is this important?	How can the healthcare industry simplify access to patients with help of digital platforms?	Patient journey mapping	Definitive Health care (n.d.)
Which customer segment / patient group do you target?	How can the healthcare industry simplify access to patients with help of digital platforms?	Competitive advantages for companies; Target new customer segments	Girdwichai (2020); Stone (2019)

What new possibilities do you offer to patients?	How can the healthcare industry simplify access to patients with help of digital platforms?	Benefits for patients; New opportunities through platform businesses	Reillier & Reillier (2017); Gawer (2022); Ozalp et al (2022); Stone (2019)
Who are your biggest competitors? Are there other companies that created a similar platform business/offer similar services?	How can the healthcare industry simplify access to patients with help of digital platforms?	Type of existing healthcare platforms	Roland Berger (2020)

Table 3: Questionnaire for Healthcare Companies

Questionnaire for additional Industry Experts

Question	To which research question is it linked?	Why is this important? (Statement in literature)	Foundation in literature (author)
What are key drivers that accelerated the development of digital healthcare services and digital platforms in the healthcare industry?	What are the drivers that push the healthcare sector to transform into a more patient-focused industry?	Major drivers of digitalization in health care	Roland Berger (2020); McKinsey (2023); Ozalp et. al (2022); Capgemini (2021)
What are the main benefits of digital healthcare services / digital healthcare platforms for patients & for healthcare organisations?	What are the benefits of implementing such platforms for healthcare businesses?	Competitive advantages for companies; Increase value through data analysis; Cost efficient; Network effect; Facilitate access for patients	Gawer (2022); Ozalp et. al (2022); Reillier & Reillier (2017); Stone (2019)
What new value streams open up through these digital healthcare services / digital healthcare platforms? How can additional profits be generated?	What are the benefits of implementing such platforms for healthcare businesses? How can the healthcare industry simplify access to patients with help of digital platforms?	Digital health care ecosystems; Existing healthcare platforms; The patient journey; Business model canvas	Sanchez-Iborra and Skarmeta (2022); Roland Berger (2020); Definitive Health care (n.d.); Reillier & Reillier (2017)
What are risks and/or limitations of digital healthcare services / digital healthcare platforms?	What are the benefits of implementing such platforms for healthcare businesses?	Strict regulations in the healthcare sector; Data privacy concerns	Ozalp et al (2022); Parker et al (2016)
What are the main challenges when creating digital healthcare services / digital healthcare platforms?	What are the benefits of implementing such platforms for healthcare businesses?	Complexity of the healthcare industry; Information silos; Limited data sharing; Information asymmetry	Roland Berger (2020); Kane et al (2015)

What are the main cost factors when developing digital healthcare services / digital healthcare platforms?	What are the benefits of implementing such platforms for healthcare businesses?	Integrating new digital solutions is a costly procedure	Matt et al (2015)
What recent regulatory changes impacted the digitalisation in the healthcare industry?	What are the drivers that push the healthcare sector to transform into a more patient-focused industry?	Strict regulations in the healthcare sector	Ozalp et al (2022); Parker et al (2016)

Table 4: Questionnaire for additional Industry Experts

Appendix C: Coding Overview for Interview Analysis

Selective Code / Theory 1 & 2	Axial Code	Open code	Example of Quotation
Design patient-focused services through digital health care platforms to improve lives of patients and doctors	Patient	Benefits for Patients	<i>Patients do not only want information but also solutions. Therefore, an online symptom checker is not enough, he also directly wants a treatment plan or get connected to a doctor. A platform can facilitate both.</i>
		Patient Journey	<i>We want to extend our services to be able to provide health services and to cover the patient journey end-to-end virtually.</i>
		Patient Segment	<i>Digital services work well for young patients which need help immediately. Digital services simplify access for them and lead to a better and fast treatment.</i>
	Healthcare Organization	Doctors	<i>We want to be an attractive employer for doctors, with our digital platform we take care of the admin tasks so doctors have more time to take care of patients</i>

		Benefits for Healthcare Organizations	<p><i>The new created value depends a lot on the country. For example, in France, a General Practitioner earns more if he has more patients, so the value is to earn more time for more patients. Whereas in Italy, a General Practitioner has a flat wage so he doesn't necessarily want to get more patients. As a result, the value is to improve relationship to existing patients with more time available.</i></p>
	Digital Healthcare Services	Service Type	<p><i>On our platform we offer centralized patient document management for doctors, instant messaging solutions doctor-to-patient, teleconsultation, and online appointment booking.</i></p>
		Accessibility	<p><i>Digital Platforms make it easier to receive advise and health care treatment, also for people in remote areas, or people which have mobility issues or trouble with accessing general services.</i></p>
		Efficiency	<p><i>Technology offers increased efficiency so more patients can be treated with a higher quality. As a result, patients might be willing to pay more as they get better services.</i></p>
		Resources	<p><i>Resources can be better and more efficiently allocated with digitalization, and processes are simplified.</i></p>

Reduce barriers to create a digital healthcare ecosystem that connects different players and combines their distinct goals	Overcome Barriers	Major Challenges	<i>A major Challenge is how to build trust between the players in an open ecosystem and show them the benefits of it.</i>
		Major Cost Factors	<i>I think the biggest financial burden are employee costs. Especially when you are a tech company you have a lot of talents involved. I guess this also explains the tech crisis, the first thing you do is to fire people because they cause the biggest costs.</i>
		Technology	<i>A general problem is that the health care system has too old structures and IT systems which leads to inefficiency, a lack of doctors and dissatisfied patients. You cannot just take something existing, but you need to create something completely new.</i>
		Regulatory restrictions	<i>Regulatory restrictions are one of the main challenges when it comes to digitalisation in health care. But it varies a lot from country to country.</i>
		Information Sharing	<i>We offer online services on our patient portal with document sharing function for better communication between patients and doctors.</i>

	Create Connection in a Centralized System	Digital Ecosystem	<i>I think in order to be profitable we need to cooperate. But it's difficult, because there are so many different players which offer different solutions. It needs to be attractive and profitable for everyone to connect in one ecosystem</i>
		Platform	<i>it is not necessary that one provider covers the whole patient journey end-to-end, but it should be one platform which connects and integrates different healthcare providers to cover the whole patient journey</i>
	Business Model	Hybrid	<i>our goal is to offer hybrid healthcare, we have physical clinics, but we try to digitalize as much as possible of the patient/doctor journey</i>
		Geographic Location	<i>Germany has decentralized system. Health care systems involves multiple players in different regions which makes it difficult to implement standards. In centralized system it is easier to roll out digitalization projects or to create centralized platforms</i>

Table 5: Coding Overview for Interview Analysis

Appendix D: Business Model Canvas for an Integrated Meta Platform

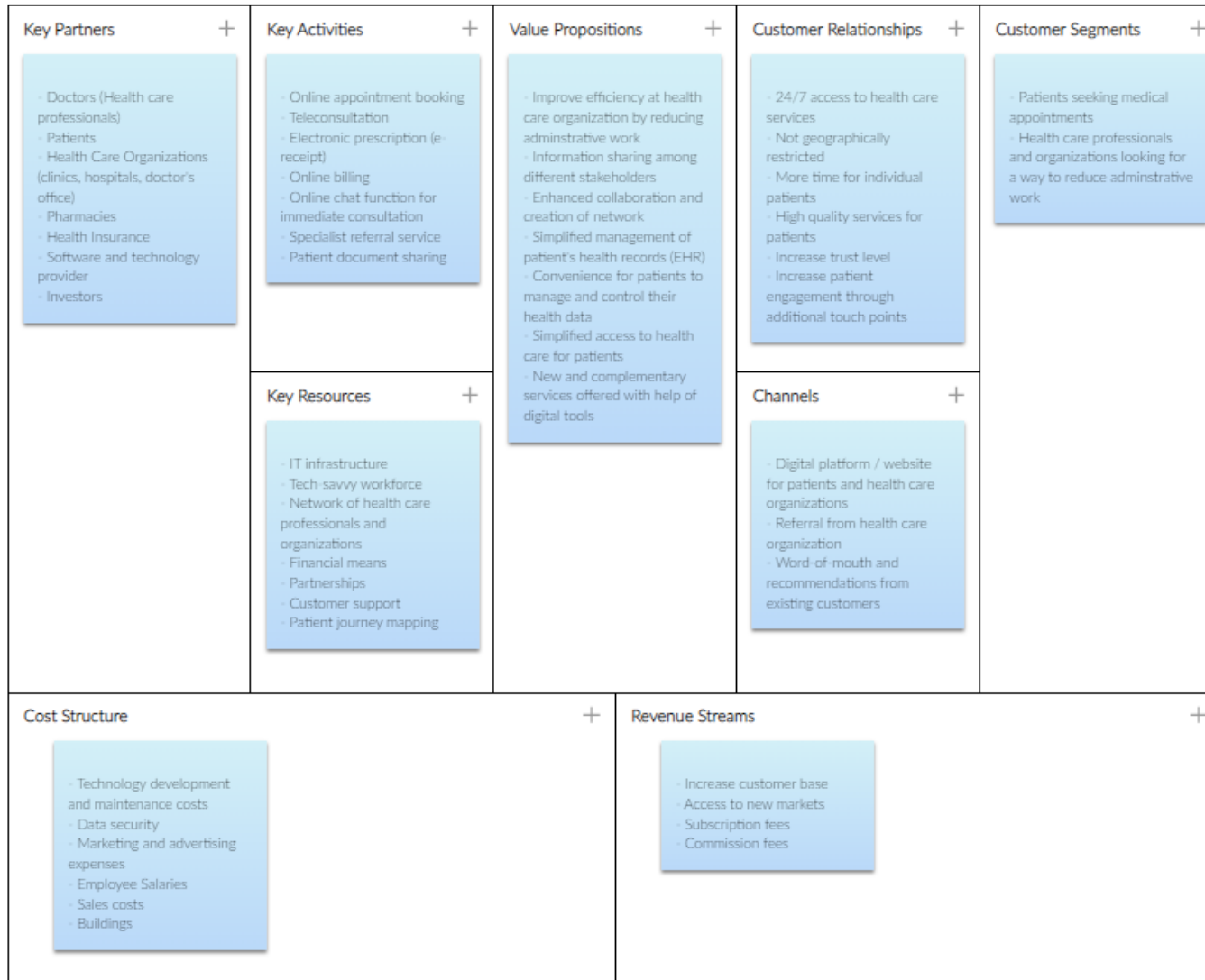


Figure 5: Business Model Canvas for an Integrated Meta Platform (source: own illustration)