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# **Digital Platforms Business Model: trends, opportunities and challenges in wearable health devices**

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**ABSTRACT:**

Tässä kandidaatintutkielmassa tarkastellaan, miten digitaaliset alustat muuttavat liiketoimintamalleja terveydenhuollossa, eritoten älykellojen ja muiden päällä pidettävien laitteiden näkökulmasta. Tutkimuksen lähtökohtana ovat terveydenhuollon kasvavat haasteet, kuten väestön ikääntyminen ja kroonisten sairauksien yleistyminen, jotka lisäävät tarvetta entistä tehokkaammille ratkaisuille. Nämä laitteet mahdollistavat jatkuvan terveyden seurannan ja sen datan yhdistäminen digitaalisiin alustoihin mahdollistaa uusia ratkaisuja, kuinka hoitaa terveydenhuolto tulevaisuudessa.

Tutkielmassa analysoidaan digitaalisia alustojen hyödyntämistä osana terveydenhuollossa, niin käyttäjien kuin myös yritysten näkökulmasta. Lisäksi tarkastellaan mitä muita haasteita näiden eri laitteiden ja alustojen yhdistäminen luo. Työ perustuu ajantasaiseen tieteelliseen kirjallisuuteen ja tarjoaa katsauksen tulevaisuuden kehityssuuntiin ja liiketoimintamallien muutoksiin.

Tulokset osoittavat, että digitaalisten alustojen ja terveysteknologia-laitteiden yhteensovittaminen mahdollistaa uudenlaisia, laajasti hyödynnettäviä ratkaisuja sekä tehokkaampaa tiedon hyödyntämistä terveydenhuollossa. Samalla korostuvat kuitenkin tiedon hallintaan, yksityisyyteen ja ekosysteemin hallintaan liittyvät haasteet, joiden ratkaiseminen on edellytys turvalliselle ja kestäväälle kehitykselle.

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**KEYWORDS:** digital platforms, business model, digitalization, wearable health devices, healthcare, value creation

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# 1 Introduction

A significant portion of public spending is allocated towards healthcare in many OECD countries. It accounts for around 10% of GDP, making it not only a critical aspect of social well-being but also a major driver of economic activity and innovation. The increasing burden that comes with an ageing population and the prevalence of chronic diseases have put increasing pressure on healthcare systems. This has led to rising costs and quality challenges. Healthcare actors are looking for solutions from technological advancements (Hermes et al., 2020; OECD, 2023).

Healthcare refers to the services that medical professionals provide to look after people's physiological and mental wellbeing. Given its economic and societal significance, the healthcare industry has been on the forefront where digital transformation has occurred. Digitalization has been marked as a core solution to address many of the challenges in the sector, including medical practice, value creation, and the demands of an ageing society (Kraus et al., 2021).

The healthcare industry has traditionally operated under the fee-for-service business model. In the fee-for-service model healthcare providers are paid according to the quantity of services delivered rather than the quality or results achieved. This model is becoming increasingly insufficient to meet the needs and expectations of patients and healthcare providers with the evolution of healthcare needs. Traditional healthcare models are evolving towards patient-centric, technology-driven ecosystems that prioritize proactive health management and personalized care where consumers can take a part regarding taking care of their health (Babatunde, 2024; Stoumpou et al., 2023).

These challenges, together with advances in digital technology and changing societal expectations, are contributing to the ongoing digital transformation of healthcare. According to Stoumpou et al. (2023), digital transformation in healthcare refers to the use of digital technology, data analytics, and creative procedures that are fundamentally altering the way healthcare organization's function. In the healthcare sector, this includes integrating modern technologies such as electronic health records, telehealth services, mobile health applications and wearable devices all aimed at improving outcomes and efficiency.

Encouraging individuals to actively manage their own health, participate in decisions about their care, and work more closely with healthcare providers is at the heart of digital health and its advantages (Brands et al., 2022). In addition to improving health outcomes, patients who participate more in their own treatment also lessen the burden and expenses on healthcare systems (Hoff et al., 2024; Brands et al., 2022).

Wearable health devices including wristbands, patches, and smartwatches are a major advancement in digital health. They are making it possible to continuously and discreetly monitor vital signs and activity levels. By giving people real-time feedback on their health, these devices are having an impact on the healthcare sector by empowering people to make better lifestyle decisions and, if necessary, seek medical help (Kang & Exworthy 2022).

The value of data collected by wearable health devices is significantly enhanced when integrated into digital platforms, which act as multi-sided ecosystems connecting users, developers, healthcare providers, and businesses. By leveraging network effects, digital platforms enable scalability, innovation, and the development of new services based on wearable-generated data (Eisenmann et al., 2006; Ghazawneh & Henfridsson, 2013; Nambisan et al., 2019).

### **Research problem and questions:**

While research on wearable devices and digital platforms has gained significant interest in recent years, most studies focus on either the technical functionalities of wearables or on ethical and privacy concerns, often treating these aspects separately. There is lack of integrated analysis on how digital platforms are transforming business models in the context of wearable devices, including value creation, capture and the interconnection between user and business perspectives.

This thesis examines how digital platforms enable and shape value creation and value capture in the context of wearable health devices. The thesis focuses on the integration of wearable technologies into digital platforms and the resulting opportunities and challenges for both users and businesses.

Research question: How do digital platforms enable and shape value creation and value capture in the wearable health device sector?

## 2 Digital Platforms and Related Business Models

A business model describes the fundamental logic of how an organization creates, delivers, and captures value for its customers and stakeholders. Teece (2010) claims that business models provide answers to how companies convert resources and capabilities into economic value. Without a well-designed, and executed business model, value of innovation cannot be captured or delivered in the most efficient way (Teece, 2010). At the core of a business model there is value proposition, value creation, and value capture (Zott & Amit, 2010). The value proposition defines what special benefits or solutions are offered and why customers are choosing one company's product or service over another's (Osterwalder & Pigneur, 2010). Value creation refers to the various processes and resources that make it possible for the organization to deliver its value proposition, often involving collaboration with partners and effective use of internal capabilities (Massa et al., 2017). Value capture defines the processes of how organizations generate revenue and profits from their activities, including pricing strategies, cost structures, and revenue streams. Together these components create the base for understanding how businesses operate and sustain themselves in competitive environments and markets.

To understand how digital platforms are changing healthcare, it is needed to first understand how the traditional healthcare system works. In the healthcare sector, the traditional business model refers to the established structures that explain how healthcare organizations deliver, manage, and monetize their services. In its most traditional form, healthcare has relied on physical spaces such as hospitals and clinics, where patients receive treatment (Ebbert et al., 2023). The value delivered in this model has been closely tied to in-person services aimed at treating illnesses and managing chronic conditions. In practice, this has meant that care is delivered face-to-face, through doctor visits, diagnostic tests, and medical treatments provided in clinical settings. The traditional healthcare system has been largely built around a fee-for-service approach, where healthcare providers are paid based on the number of procedures or appointments, not necessarily on the quality or effectiveness of the care itself (Di Guida et al., 2019 & Babatunde et al., 2024)

This model has also helped advancements in medicine, as it has supported the development of specialized expertise and medical technology. However, it has also brought several problems. Many healthcare systems struggle with inefficiency, rising costs, and unequal access to care. Patients in rural areas or from marginalized groups often face the greatest challenges in getting the help they need (Ravaghi et al., 2019).

There are also ethical concerns regarding overprovision in healthcare (Di Guida et al., 2019). When financial incentives are tied to volume rather than outcome, there is a risk that unnecessary tests and treatments are encouraged. In the worst cases, this means more money is spent without any real benefit to the patient's health. As healthcare continues to evolve, these issues highlight why a shift toward more value-centered and outcome-focused models is becoming increasingly important. Value in healthcare is measured by the improvement in a patient's health compared to the cost of the procedure to achieve the improvement. Reducing costs is important but not sufficient because value is created only when patients' health improves, therefore it comes first and reducing cost after it (Teisberg et al., 2020).

Digital business models represent an evolution from traditional business models. They are leveraging digital technologies to create new forms of value and transforming existing business processes. Digital business models use digital resources and platforms to facilitate interactions, transactions, and innovation between different users and stakeholders (Evans and Gawer, 2016 & Hermes et al., 2020).

Digital platforms are a complex concept, which have greatly shaped markets and business models. The definition of digital platform varies and there is not a clear consensus on it. However recurring definition across articles is that business platforms act as a virtual "marketplace" connecting different parties, enabling transactions between them. Traditionally, this division has consisted of two parties, the buyer and the seller, but with technological advancements and business model development digital platforms are nowadays often multifaceted (Rangaswamy et al., 2020; Vakeel et al., 2020).

Digital platforms have many defining common economic characteristics including positive direct and indirect network effects, scalability without physical mass, and broad use of customer data.

While these are not unique characteristics of digital platforms, their combined effects enable rapid growth in various sectors including healthcare. However, as highlighted by Hermes et al., platforms vary vastly in structure function, and market logic, making it complicated to establish universal definition (Hermes et al., 2020; OECD, 2019)

Digital platforms also play a crucial role in creating ecosystems that drive value for all parties. The greatest strength of digital platforms lies in bringing together different parties such as users, developers and service providers. The combination of the different parties creates an ecosystem, and the platform facilitates collaboration and value creation between the stakeholders. This ability to connect different parties and leverage their contributions is what makes them powerful and capable of quick growth (Evans & Gawer, 2016).

The processes of value creation can be understood when examining different stakeholders involved. For end users, digital platforms provide access to diverse services, personalization, and enhanced efficiency. Digital platforms allow users to access various services in one place. For example, WHOOP, which is a wearable health device company, offers users access to their physiological data and enables third-party coaching services to offer tailored plans through its developer platform.

From the perspective of service providers and businesses, digital platforms allow healthcare providers and companies to expand their reach beyond conventional limits by linking them to a larger and more engaged patient community. This improves convenience, accessibility, and affordability for patients, while at the same time lowering healthcare costs and improving clinical outcomes (Babatunde, 2024). For example, Teladoc Health is a telehealth company offering virtual health services, utilizing technology to link patients with healthcare professionals remotely (Babatunde, 2024).

Developers and complementors also play a crucial role in the value creation process. Digital platforms structure value-generating activities by providing developers with opportunities for innovation and monetization. These platforms act as digital consignment marketplaces, enabling developers to sell applications, content, or services. As multisided platforms, digital platforms define the conditions of engagement, promoting collaborative ecosystems. However, developers may

face difficulties such as unstable employment and centralized control by platform owners, who control data access and revenue sharing (Kenney & Zysman, 2016).

Overall, digital platforms produce value in many ways by integrating various elements and encouraging innovation by lowering entry barriers, thus allowing a wider array of participants to provide specialized services. Platforms can utilize network effects to generate value by providing frameworks where user interactions enhance value, leading to effects that benefit all stakeholders (Kenney & Zysman, 2016). They also simplify processes, lower transaction costs, and increase transparency (OECD, 2019).

To illustrate the differences between traditional healthcare business models and digital platform-based approaches, Table 1 provides a comparison of their value proposition, value creation, and value capture mechanisms, as identified in the literature.

**Table 1. Comparison of traditional and digital platforms business models in healthcare**

<b>Aspect</b>	<i>Traditional Healthcare Business Model</i>	<i>Digital Platform Business model in healthcare</i>	<i>References</i>
<b>Value Proposition</b>	Occasional, in-person care focused on treating specific conditions and managing chronic conditions	Continuous, data-driven, personalized care. proactive health management	Ebbert et al., 2023; Hermes et al., 2020;
<b>Value Creation</b>	Physical infrastructure (hospitals, clinics), face-to-face interactions, specialized professional.	Digital ecosystems, integration of multiple actors (users, providers, developers), real-time data, network effects	Hermes et al., 2020; Babatunde, 2024;
<b>Value Capture</b>	Fee-for-service, insurance based, out-of-pocket payments.	Subscriptions, transaction fees, data monetization, value-based payments	Di Guida et al., 2019; Babatunde, 2024;

## **2.1 Key Business Models on Digital Platforms**

There are different types of digital platforms that have gained significance due to the fast growth of online services and the shift in consumer behavior towards digital interactions, making them essential for businesses seeking competitive advantages. These platforms have taken different approaches to generate revenue and deliver value to users in the digital economy.

### **2.1.1 Marketplace**

The first type of platform identified is the Marketplace business model which connects sellers of products and services and buyers. In this model the digital platform is located as the center of their business, therefore it is the facilitator of business. Revenue of a marketplace model is generated from the transactions on the platform, which typically is a transaction fee. The revenue from the transactions needs to cover the platform maintenance and development for it to cover the costs and be potentially profitable. For example, let's take a look at Airbnb which is a digital platform that connects property owners and people in need of short-term accommodation. Airbnb provides property-owners with a marketplace where they can advertise their property and offers search functionality for people looking to book a place to stay. A modular software platform enables value creation by offering services like payments and recommendations, enhancing efficiency and user experience (Hein et al., 2019).

### **2.1.2 Social Community**

The second business model of a digital platform identified is the social community business model, this model does not prioritize financial benefits, instead adding value to a social community through platform usage, focusing on social benefits (Cîmpan et al. 2022). However, many social communities have a wide variety of revenue models, with one of the best-known being advertisement-based models, which charge companies to display ads to users, often thus enabling free usage and generating financial benefits for the platform (Sindermann et al., 2024).

### **2.1.3 Software Ecosystem**

The third digital platform business model is the software ecosystem, in which the highlight of the service is the digital platform, which acts as a focal point for the ecosystem. These software

ecosystems are often targeted towards large multinational enterprises and the revenue is generated through sales of physical products and the applications related (Cîmpan et al. 2022). A key aspect of this model is to foster innovation by enabling third-party developers that are often referred to as complementors, to create solutions that enhance the platform's core functionality. The platform owner cherishes and supports this by providing development tools and resources (Ghazawneh & Henfridsson, 2013; Nambisan et al., 2019). An example of this type of business is SAP's cloud platform that provides developers with tools to create applications that integrate with its enterprise resource planning software. This approach not only delivers solutions to customers but also drives revenue growth through the sales of complementary applications (Hein et al., 2019).

#### **2.1.4 Subscription-Based Model**

In the subscription-based model, a company provides content, products, or services in exchange for recurring payments. Customers pay periodically to maintain access. This way businesses generate predictable revenue while fostering long-term customers. A key advantage of this model is the ability to provide ongoing updates and tailored services, which align with modern consumer preferences over the traditional ownership approach (Lindström et al., 2023)

#### **2.1.5 Freemium Model**

Freemium business model is a model where business provides a basic version of a product or service for free, with the aim of convincing enough customers to purchase the premium version of the product or service. The key to succeeding is to offer an excellent product for free while still incentivizing users to upgrade. A well-known example of freemium model is Spotify, and it allows users to listen music for free with advertisements, while offering a premium subscription that offers more features and ad-free listening encouraging users to upgrade (Holm & Günzel-Jensen, 2017).

#### **2.1.6 On-Demand Service Model**

The on-demand service business works by connecting customers to independent workers in real time through platforms like Uber and Lyft which are ride-hailing applications offering a modern alternative to standard taxi transportation. These on-demand service platforms operate in two-

sided markets, aiming to balance out the customers need for low prices and short wait times, and workers need for fair wages and steady income. By utilizing economies of scale, they reduce waiting and improve efficiency, creating benefits and value for both sides (Wu et al., 2020).

### **3 Wearable Health Devices and Related Business Models**

The path businesses develop, deliver, and collect value has had a major shift because of digital platforms, which have emerged as a disruptive force in many different industries, healthcare being one of them.

#### **3.1 Definition and Types of Wearable Devices**

Wearable technology includes a wide range of devices that are worn on the body or attached to the user. There is ongoing debate about whether smartphones should be classified as wearable technology, but this thesis does not focus on them. The widespread adoption of smartphones played an important role in the resurgence of wearable technology, largely because of the emergence of third-party applications that have fueled innovation. Wearable technology can be divided into two main categories. Primary devices operate independently and often serve as a central base connecting to other devices, with wrist-worn fitness trackers being a typical example. Secondary devices, on the other hand, are designed to perform a specific task or measurement, such as heart rate monitors, which then transmit data to primary devices for analysis (Godfrey et al., 2018).

#### **3.2 Use Cases and Benefits of Wearable Devices**

One of the main uses of wearable medical technology in the healthcare industry is health monitoring. These technologies allow for continuous monitoring of vital factors like heart rate, blood oxygen saturation, and physical activity. The information they produce can be useful in tracking symptoms of illnesses like COVID-19 and in identifying medical disorders like atrial fibrillation (Canali et al., 2022).

In addition to health monitoring, wearable devices play a significant role in promoting behavioral changes. They encourage physical activity through daily step challenges and goal setting, helping users to maintain an active lifestyle. Research has shown that self-monitoring and receiving

feedback on behavior are particularly effective in supporting long-term lifestyle improvements (Laranjo et al., 2021; Huhn et al., 2022).

Wearables also can empower patients to manage chronic conditions more independently. By providing real-time health data, these devices reduce the need for frequent doctor visits. Many applications present feedback on physical activity, enabling users to better understand and control their health status (Kang & Exworthy, 2022). There lies potential for reducing costs with wearable devices as they enable early diagnosis and more efficient management of chronic diseases (Piwek et al., 2016).

From a healthcare system perspective, wearable devices can improve efficiency. Integrating wearable data into care plans reduces the necessity for face-to-face appointments and helps the overall burden on healthcare services (Canali et al., 2022; Kang & Exworthy, 2022).

Also, wearable devices facilitate large-scale research and data collection. Because these devices can be worn continuously by a wide range of users, they enable the collection of vast amounts of data for population studies. This data supports clinical trials and health trend research, providing valuable insights for both clinicians and researchers (Laranjo et al., 2021).

### **3.3 Business Models in the Wearable Device Market**

With the possibility to continuously monitor physiological data and empower individuals to take a more proactive approach managing their own health wearable health devices have emerged as a crucial component of the digital health ecosystem. This market's business strategies have had to adapt to suit both the changed customer expectations and technological advancements. In this section I will examine the two most dominant business models in the wearable health device market, their value propositions and the ethical considerations they raise.

#### *Traditional hardware sales model*

The most obvious and traditional business models for wearables focus on generating revenue is by hardware sales, where the customer makes a one-time purchase and receives the product itself without requiring long-term guaranteed commitment from consumers. This model relies

heavily on one-time purchases, making revenue less predictable compared to other revenue generation models (Global Newswire, 2024).

### *Subscription-Based Services*

Instead of the basic hardware sales model, companies are now changing their business model towards a subscription-based service model. This model approach guarantees a certain amount of recurring revenue for companies compared to one-time purchases. This is increasingly prevalent in various device types within the wearable tech market (Global Newswire, 2024). Services such as fitness coaching, health data analytics, and software updates are often included in subscription models, providing customers value beyond the initial hardware purchase (Simon-Kucher, 2023). A notable example of the subscription model is a fitness tracker company WHOOP, which has adopted a pure subscription approach. The device (wristband) is included via a subscription, and users pay monthly or annual subscription to access WHOOP's analytics platform that provides data on different health markers. With this approach WHOOP enables building long-term customer relationships and improve user retention through consistent engagement and software enhancements (Contrary Research, n.d.). Similarly to WHOOP, the Finnish smart ring provider Oura has shifted towards subscription-based model where the ring is purchased traditionally, but Oura also provides a subscription to access advanced features which include for example, detailed sleep tracking and personalized health recommendations. This dual structure allows the company to maintain strong gross margins while leveraging ongoing subscription revenue to fund continued development and platform improvements (Contrary Research, n.d.).

## **3.4 Negative Aspects and Ethical Concerns**

Wearable health devices collect large amounts of sensitive health data that are often stored in cloud and shared with third parties. This flags as a privacy concern as often the data is being used without having proper informed consent (Segura Anaya et al., 2018). Research shows that users are worried about the data collected and think that consent to use the data is important, although not always understanding how the data is being used. A problem in this field is also that wearable devices for consumer usage are not regulated the same way as medical-grade devices (Dobson et al., 2023).

Numerous wearable health devices lack adequate information security safeguards, leaving them open to hacking, data theft, and illegal access. The likelihood of potential data breaches is increased by weak encryption, inadequate authentication, and infrequently updated security patches. These breaches can have major repercussions for consumers, including identity theft. An instance of this occurred when a data breach compromised the privacy of over 61 million Apple and Fitbit user records (TechTarget, 2021, Sui et al., 2023).

Users might also not fully understand what they've consented to and how their data is collected, used or shared, especially when the data moves around different platforms and jurisdictions. Many times transparent and clear consent management is lacking, undermining the problem. Also, the problem with consent comes when people are not focusing on what they are consenting to, one study estimates that 97% of people indicate agreement to a privacy policy in 51 second, when it should take 30 minutes to read the policy (Sui et al., 2023).

### **3.5 Wearable Health Devices and Related Business Models**

The following table (Table 2) summarized the main outcomes, value creation mechanisms, business opportunities, and key challenges associated with digital platform business models in the context of wearable health devices, as identified in the literature.

**Table 2. Outcomes, value creation mechanisms, opportunities, and challenges of wearable health device business models.**

<b>Aspect</b>	<b>Description / Example</b>	<b>References</b>
<b>Outcome</b>	Improved health outcomes, cost savings, more efficient healthcare delivery	Piwek et al., 2016
<b>Value creation for users</b>	Real-time health monitoring, personalized feedback, engage the patient as an active participant in their care	Canali et al., 2022
<b>Value creation for business</b>	Subscription revenue, data monetization, long-term customer relationships, new service models.	Simon-Kucher, 2023; Evans & Gawer, 2016
<b>Opportunities</b>	New markets, scalable services, personalized healthcare, research data, ecosystem partnerships.	Evans & Gawer, 2016; Piwek et al., 2016
<b>Challenges</b>	Privacy risks, data security, informed consent and ethical issues.	Segura Anaya et al., 2018; Dobson et al., 2023; Sui et al., 2023

## **4 Integrating Business Models of Digital Platforms and Wearable Devices**

This chapter aims to explore the convergence of digital platforms and wearable health devices, discovering and focusing on how their integration creates new opportunities and challenges within the healthcare ecosystem.

### **4.1 Value Co-creation in Integrated Health Ecosystems**

Digital platforms and wearable devices work together to provide dynamic service delivery, user personalization, and continuous data flow. Wearable devices collect vast amounts of personalized data with sensors which have limited utility in isolation. When the data is transferred to a digital platform such as Apple Health or Google Fit the data becomes more useful and easier to read and understand. The data is structured, analyzed, and transformed into personalized services that improve user engagement and retention.

From a business model view, this combination enables companies to grow with the help of network effects. More wearable device users increase data richness which improves service quality and predictive analysis. With this it attracts more third-party users such as developers and service-providers, forming a cycle forming a virtuous cycle of innovation and adoption (Evans & Gawer, 2016; Ghazaweh & Henfridsson, 2013). To build a successful platform ecosystem, the platform owner must change its focus from developing applications to providing resources and chances that support third-party developers to develop better applications (Sawy et al., 2010; Selander et al., 2010). Ghazaweh & Henfridsson (2013) claim that such resources, and chances are, i.e. software tools and regulations that work as a “arm’s length connection” between the platform owner and the third-party developers.

## 4.2 Risks and Ethical Challenges of Integration

While the integration of wearable devices and digital platforms creates business potential it also introduces new critical challenges related to privacy and safety. Wearable devices collect and handle significant amounts of data and if this information is unlawfully accessed by third parties, both users and corporations could face major negative consequences (Anaya et al., 2018; Sui et al., 2023). Beyond direct security and safety challenges and data breaches, inadequate transparency about data usage can damage brand trust which is an essential asset in platform-based business models. The U.S Federal Trade Commission tested 12 different mobile health or fitness applications and found that the data of the users were shared with 76 different third-party companies (Federal Trade Commission, 2014; Steinhubl et al., 2015). This data included technical information about the users devices, but also precise data about the users bodies and health.

When considered from a managerial standpoint, trust-building mechanisms such as transparent data policies are key to operating transparently. Mentioned before research indicates that over 90% of users agree to privacy policies without reading them within 51 seconds, despite average policies requiring 30 minutes to understand (Sui et al., 2023). Therefore, reducing information asymmetry should be a strategic priority.

In conclusion, the healthcare ecosystem is undergoing a significant transformation due to the combination of wearable medical technology and digital platforms. Dynamic value co-creation is made possible by this convergence, where ongoing data flow and user customization create corporate innovation and user engagement. Both users and businesses gain from the scalable growth and quick creation of new services made possible by the ensuing network effects and platform-based business models (Evans & Gawer, 2016; Ghazawneh & Henfridsson, 2013).

There are also a lot of difficulties with this integration, especially when it comes to consumer trust, security, and data privacy. To preserve credibility and guarantee sustainable growth, platform owners and device makers must place a high priority on transparent data policies, strong

security measures, and ethical practices as the amount and sensitivity of health data expand (Sui et al., 2023; Steinhubl et al., 2015).

## 5 Discussion and conclusions

This chapter provides a conclusion of the findings focusing on how digital platforms are transforming business models in the context of wearable health devices. It also provides key insights into the study and focuses on highlighting areas where further exploration is needed.

### 5.1 Discussion

The goal of this thesis was to find out how business models in the healthcare ecosystem are changing because of the combination of wearable health devices and digital platforms. Research has shown that the convergence of these two domains is changing the roles of users, businesses, and third-party users in digital health in addition to changing how value is created and captured.

One of the main conclusions is that dynamic, ongoing, and customized service delivery is made possible by the integration of wearable technology with digital platforms. The usefulness of wearable technology is frequently restricted to simple data collecting, such as heart rate monitoring or step counts, when it functions independently. However, the value of this data increases significantly when it is incorporated into a digital platform, like Google Fit, Apple Health, or other health ecosystems. By collecting, analyzing, and organizing data, the platform makes it possible to offer personalized health advice, predict health trends, and create new services. As more users and third-party developers are drawn to the ecosystem, this approach not only improves user engagement and retention but also starts a positive feedback loop that spurs innovation (Evans & Gawer, 2016; Ghazawneh & Henfridsson, 2013).

Through both direct and indirect network effects, this integration promotes scalable growth from a business model standpoint. The more users and devices connected to the platform, the “better” the data pool becomes, improving the quality of analytics and services. This, in turn, attracts additional users, healthcare providers, and developers, further reinforcing the platform’s value proposition. Through software tools, and transparent governance frameworks, the platform owner’s role changes from creating all services internally to facilitating third-party innovation (Sawy et al., 2010; Selander et al., 2010).

But there are also serious issues combining wearable technology with digital platforms, especially when it comes to consumer trust, security, and data privacy. Because health data is sensitive and cyber threats are becoming more sophisticated, data breaches or misuse can have serious repercussions for both users and businesses. According to research, inadequate data management procedures and a lack of transparency can quickly undermine user confidence (Sui et al., 2023; Steinhubl et al., 2015). According to Sui et al., (2023) users claim that they frequently accept privacy policies without reading them, which emphasizes the need for more understandable consent procedures and clearer communication.

## **5.2 Practical implications**

The results of this thesis highlight how crucial it is for practitioners—businesses, developers, and healthcare providers to approach digital health innovation comprehensively and ecosystem-wise. Long-term success seems to depend on establishing trust via open data rules, strong security protocols, and especially user-centered design. Businesses should spend budget on creating open, interoperable platforms that support innovation from third parties while upholding strict governance and quality assurance. Developing strategic alliances with technology firms, regulators, and healthcare providers could also speed up the adoption of innovative solutions and aid in navigating the complicated world of digital health.

## **5.3 Limitations and suggestions for future research**

This thesis is based on existing research and literature and does not include empirical evidence. Because of this, the practical difficulties and real-world experiences of integrating wearable devices and digital platforms remain widely unexplored. Additionally, the thesis does not compare different healthcare systems, regulations or markets. Future research could explore how these integrations work in practice in different countries or healthcare environments. Furthermore, more research is required to fully understand and react to privacy policies, data sharing, and trust issues. This understanding would be strengthened by research that incorporates case studies or user surveys. Finally, as technology and business models keep evolving, future studies could look at which business models such as subscription or hybrid models are most successful and sustainable in the digital health field. Future research can offer more insights and assist businesses and

healthcare providers in making better use of wearables and digital platforms by focusing on these aspects.

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