Stakeholder perception towards a medication delivery platform in Austria and its impact on different stakeholder groups.

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AFFIDAVIT

I hereby affirm that this Master's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

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ABSTRACT

Over the past decade, digital health innovation has experienced impressive growth. The COVID-19 pandemic has further accelerated this trend, as all of the stakeholders of the healthcare sector became increasingly aware of the benefits digital health solutions can provide to them. This research examines the stakeholder perception of a conceptual medication delivery platform solution, as well as the impacts and effects on the stakeholder groups that are expected to arise from it. Furthermore, conclusions regarding stakeholder wants and needs are drawn and benefits and downsides of the platform are discussed.

To answer the research question of this thesis, a mixed-methods approach consisting of a consumer survey and expert interviews is used. Subsequently, the findings are discussed and refined through discoveries from the literature. Five relevant stakeholder groups are identified - consumers, doctors, pharmacies, the pharmaceutical industry, and social insurances. Subsequently, stakeholder perspectives are reflected and thus, overlaps and differences in stakeholder perception are discussed. The results show a variance in stakeholder needs regarding digital health innovation. Furthermore, stakeholder perceptions regarding the proposed platform solution were generally positive, as added value exists for all of the stakeholder groups. However, concerns regarding data privacy, social risk, and the cost of the platform remain. Overall, the need for a more effective allocation of the healthcare system's resources through the use of digital health innovation became evident throughout this research.

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1 INTRODUCTION

Digital health tools have the potential to improve all domains of healthcare and their benefits include improved quality of care, increased cost efficiency, better resource allocation, and real-time monitoring of the effect of prescribed treatments. These benefits have become increasingly visible with increasing adoption rates. Over the past decade, the digital health innovation sector has experienced significant growth. Thus, venture capital investment in digital health grew 1000-fold during this time. The growth in adoption rates of digital health tools has further been enhanced by the COVID-19 pandemic. The Corona Crisis thus acted as a trigger for mass adoption of digital health tools, as using them became a necessity rather than a choice (Szijártó, 2020). The pandemic made the limited resources of the healthcare sector more apparent than ever, and thus the positive trend in digital health adoption rates is expected to continue post-COVID (Safafi & Kalis, 2020).

The new opportunities for digital health innovation created by the challenges of the pandemic form a big part of the motivation of this thesis. Thus, the researcher is highly interested in finding a solution to making medicine more accessible to consumers suffering from limited mobility. Additionally, the highly complex nature of the healthcare framework intrigues the researcher to find a solution that enables better stakeholder alignment and creates a new market opportunity. Thus, proposing a medication delivery platform solution to the stakeholders and subsequently analyzing stakeholder perceptions towards it is selected as the topic of research.

This study examines stakeholder perception towards a medication delivery platform, in Austria. The research question of this thesis thus reads: “How would the implementation of a medication delivery platform be perceived by consumers, doctors, pharmacies, the pharma industry, and social insurances in Austria and what kinds of effects/impacts can be expected on the different stakeholder groups?”. The goal of this research is to gain a deep understanding of the effects and impacts of such a platform on the stakeholders, as well as their perception of it. Finally, a mixed-methods research approach is used to establish stakeholder-specific findings.

This thesis is structured along six chapters, starting with an introduction regarding the topic of research. Moreover, the motivation of the research, as well as the research question, and the goal of the thesis are presented to the reader in the introductory chapter.

The second chapter consists of a literature review on consumer behavior theory, focusing on factors influencing user acceptance of Information Technology. Additionally, healthcare-innovation-related literature, with a focus on eHealth, online pharmacies and their advantages and flaws, the complicated framework of healthcare innovation, the role of the Internet of Things in the pharmaceutical industry, and digital platform innovation, is discussed. Moreover, the state

of play and adoption rates of digital health innovations are discussed. Thus, the global digital divide and consumer interest in virtual healthcare, as well as digital health during COVID-19, and the current state of online pharmacies are presented to the reader. In addition, the evolution of digital health investment, as well as the health status in Austria are discussed.

The third chapter presents the research methods of this thesis to the reader. Firstly, the research design is discussed. Secondly, the research strategy – including the two means of primary research – is presented to the reader. Thus, the first research method discussed is the consumer survey. This survey is used to benchmark consumer needs, - interest, and – perception regarding such a platform. Subsequently, the expert interviews are discussed. The interviews provide the different stakeholder perceptions and present potential impacts of the platform concept on the stakeholder groups. Finally, the data analysis approach is discussed in this chapter.

The fourth chapter of this research presents the reader with the findings from the primary research. Firstly, descriptive statistics arising from the consumer survey, as well as the conducted factor analysis are discussed. Secondly, the consumer survey-based hypotheses are validated. Lastly, findings from the expert interviews are presented along with a thematic cluster analysis.

The fifth chapter discusses the findings from the consumer survey, as well as the expert interviews, and subsequently forms a synthesis of the results arising from the two primary research instruments.

The sixth and last chapter of the study concludes the findings and discusses the implications of the study, as well as the potential for future research.

2 LITERATURE REVIEW

2.1 Topics Covered

The literature review of this thesis aims at introducing topics to the reader that will serve as the basis for answering the research question "How would the implementation of a medication delivery platform be perceived by consumers, doctors, pharmacies, the pharma industry, and social insurances in Austria and what kinds of effects/impacts can be expected on the different stakeholder groups?". Firstly, consumer behavior theory is reviewed. As the research question is based on a conceptual online platform, constructs influencing user acceptance of information technology are discussed. Therefore, this part of the literature review allows for a better understanding of factors that might influence consumer perception of innovation. Moreover, consumer expectations for home delivery services and pharmacy encounters are discussed. Constructs and findings discussed in this subchapter serve as the basis for the consumer survey and thus support the researcher in answering the consumer-related part of the research question. Secondly, literature regarding healthcare innovation is discussed. This subchapter includes a definition of eHealth, an introduction to the concept of online pharmacies and how they operate, as well as their advantages and flaws, a collection of issues that make healthcare innovation rather complicated, an overview on the use of the Internet of Things in the pharmaceutical industry, and lastly literature regarding digital platform innovation. The topics reviewed in this second subchapter of the literature review serve as the basis for the expert interviews conducted by the researcher and thus help understand the challenges and opportunities of healthcare innovation, as well as the different stakeholder perceptions regarding the topic of research. Thirdly, the state of play and adoption rates of digital health innovations are reviewed. Thus, the concept of eHealth literacy, as well as the digital divide, and consumer interest in virtual healthcare are discussed. Additionally, the state of play of digital health investment, as well as digital health and the general health status in Austria are introduced to the reader. Lastly, the impact of COVID-19 on adoption rates of digital health tools, as well as the state of play of online pharmacies are discussed. Besides serving as a part of the basis for the expert interviews conducted by the researcher, this subchapter also provides the reader with a better understanding of the current state of digital health in Austria and the world.

2.2 Consumer Behavior Theory

At the core of effective eHealth innovation is the urge to better understand and meet consumer wants and needs (Bhatti et al. 2018). The importance of this goal has first been mentioned by Morgall and Almarsdóttir (1999) concerning new ways of pharmacy practice. Meeting consumer needs is of utmost importance to the success of any innovation (Bhatti et al., 2018; Herzlinger, 2014). Accordingly, to better understand consumer wants and needs in terms of a medication

delivery platform, the researcher identifies the importance of integrating consumer behavior theory in this thesis.

2.2.1 User Acceptance of Information Technology

Perceived ease of use and perceived usefulness:
Davis (1989) reports the two constructs of perceived ease of use and perceived usefulness as integral determinants of consumer acceptance of information technology – or IT for short. According to the author, usage behavior towards IT depends on both – the degree to which said IT is perceived as an enhancement to the consumers' efficiency, as well as the degree to which the information technology is perceived as being easy to use by the consumer (Davis, 1989). Although Davis (1989) found perceived usefulness to be linked to consumer acceptance of IT significantly stronger than perceived ease of use, the user might be discouraged to adapt an IT, if he or she perceives it to be too difficult to use. However, no amount of perceived ease of use will stimulate the consumer towards using an IT if the consumer does not perceive it as somewhat useful (Davis, 1989). According to Davis (1989), perceived ease of use should be viewed as a causal antecedent to perceived usefulness, rather than a parallel. This means that perceived ease of use might make it easier for potential users to identify the usefulness of an IT. Therefore, perceived ease of use is expected to have a noticeable impact on the adoption and growth rates of an IT – especially during the early stages of implementation (Davis, 1989). Finally, Davis (1989) states that it is important to note that even if an IT is objectively increasing an individual's efficiency if it is not subjectively perceived as useful by the consumers, they are unlikely to use it. These concepts are further elaborated on by Venkatesh et al. (2003).

To better understand what affects user acceptance of IT, Venkatesh et al. (2003) unify the many concepts of consumer behavior theory into four constructs that are theorized to affect user acceptance of IT.

Performance Expectancy:
The first construct is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance". This construct is proven to be the strongest predictor of intention and remains significant during the stages of adoption, as well as continued use, in voluntary -, as well as mandatory settings (Venkatesh et al., 2003). It consists of the above-mentioned concept of perceived usefulness, extrinsic motivation – defined as "the perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions" (Davis et al., 1992 in Venkatesh et al., 2003), job-fit – defined as "how the capabilities of a system enhance an individual's job performance" (Thompson et al., 1991 in Venkatesh et al., 2003), relative advantage – defined as "the degree to which using an innovation is perceived as being better than using its precursor" (Moore &

Bensabat, 1991 in Venkatesh et al., 2003), and outcome expectations – defined as "the relation to the consequences of behaviors" (Compeau & Higgins, 1995 in Venkatesh et al., 2003).

Effort Expectancy:
The second construct the authors mention is defined as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003). It consists of the above-mentioned concept of ease of use, as well as the concept of complexity – which is defined as "the degree to which a system is perceived as relatively difficult to understand and use" (Thompson et al., 1991 in Venkatesh et al., 2003), and the concept of ease of use – which is defined as "the degree to which using an innovation is perceived as being difficult to use" (Moore & Bensabat, 1991 in Venkatesh et al., 2003). This construct was found to be significant during the first period of user adoption, in both voluntary and mandatory usage contexts, by the authors (Venkatesh et al., 2003).

Social Influence:
The third construct affecting consumer acceptance of IT is defined by the authors as "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003). This construct consists of the subjective norm – defined as "the person's perception that most people who are important to him think he should or should not perform the behavior in question" (Azjen 1991; Davis et al. 1989 in Venkatesh et al., 2003), social factors – defined as "the individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations" (Thompson et al., 1991 in Venkatesh et al., 2003), and the image – defined as "the degree to which use of an innovation is perceived to enhance one's image or status in one's social system" (Moore & Bensabat, 1991 in Venkatesh et al., 2003). None of the theories within this construct are found to be significant in voluntary conditions, yet become significant when mandated (Venkatesh et al., 2003).

Facilitating Conditions:
Venkatesh et al. (2003). define the fourth construct as "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system". It consists of perceived behavioral control – which "reflects perceptions of internal and external constraints on behavior and encompasses self-efficacy, resource facilitating conditions, and technology facilitating conditions" (Ajzen, 1991; Taylor & Todd, 1995 in Venkatesh et al., 2003), facilitating conditions – defined as "objective factors in the environment that observers agree make an act easy to do, including the provision of computer support" (Thompson et al., 1991), and compatibility – defined as "the degree to which an innovation is perceived as being consistent with existing values, needs and experiences of potential adopters" (Moore & Bensabat, 1991 in Venkatesh et al., 2003).

Additionally, the authors summarize concepts that they theorize will not affect the consumers' behavioral intention. These consist of attitude-behavior – defined as "an individual's positive or negative feelings about performing the target behavior" (Davis et al., 1989 in Venkatesh et al., 2003), intrinsic motivation – defined as "the perception that users will want to perform an activity for no apparent reinforcement other than the process of performing the activity per se" (Davis et al., 1992 in Venkatesh et al., 2003), affect toward use – defined as "feelings of joy, elation, or pleasure; or depression, disgust, displeasure, or hat associated by an individual with a particular act" (Thompson et al., 1991 in Venkatesh et al., 2003), and affect – defined as "an individuals' liking of the behavior (Compeau & Higgins, 1995 in Venkatesh et al., 2003). This refers to the wheel of emotions (Thompson et al. 1991 in Venkatesh et al., 2003).

Perceived risk and uncertainty:

The concept of perceived risk is defined as "… risks in terms of the consumer's perceptions of the uncertainty and adverse consequences of buying a product (or service)" (Dowling and Staelin, 1994 in Littler & Melanthiou, 2006). To the consumer, the construct of perceived risk has two components – the cost dimension and the probability dimension (Littler & Melanthiou, 2006). These components are commonly multiplied to evaluate consumer perceived risk (Littler & Melanthiou, 2006). Generally, perceived risk can be applied to 6 areas – performance, physical, psychological, time loss, social and financial. The authors add a seventh domain that becomes especially relevant in IT innovation – security (Littler & Melanthiou, 2006). In terms of evaluating consumer acceptance of innovation, perceived risk has one major downside – it requires some form of knowledge about the benefits and costs of innovation, as well as the implicit or explicit judgment of the probabilities of potential outcomes (Littler & Melanthiou, 2006). In disruptive innovation consumers often lack such information, as it is often accompanied by high levels of uncertainty (Littler & Melanthiou, 2006). Therefore, the authors argue for the importance of understanding the separate concept of uncertainty, which can be applied when there is an inability to know about certain factors that would normally affect perceived risk (Littler & Melanthiou, 2006). This inability to judge potential outcomes is however not found to negatively affect consumer acceptance of innovations, as lack of knowledge is not listed as a significant concern by the participants of the study (Littler & Melanthiou, 2006). After the early adoption stage, both of these concepts become increasingly irrelevant to consumer behavior, as increased consumer awareness positively affects the possibility of assessment by the consumer (Littler & Melanthiou, 2006). According to the authors, a possible way of managing consumer uncertainty involves offering simulations as a way of experiencing the innovation to the consumer (Littler & Melanthiou, 2006). Additionally, offering help to the consumer through personal interactions with representatives of the innovator was found to be effective (Littler & Melanthiou, 2006). The authors see a better understanding of this construct as an opportunity to scope and shape consumer attitudes and a chance for more effective marketing of innovations (Littler & Melanthiou, 2006).

Perceived innovativeness:
The construct of perceived innovativeness is composed of a measure determining how new the consumer perceives the product to be and the extent to which the innovation is expected to affect consumption patterns (Lowe & Alpert, 2015). Alternatively, perceived innovativeness can be measured by combining two items that reflect the benefits of the innovations to the consumer with two items that reflect the impact of the innovation on the consumption experience (Alexander et al, 2008 in Lowe & Alpert, 2015). According to the authors, consumers perceive products to be innovative if they inherit some sort of technological advance, or offer a relative advantage, in comparison to other products, to the consumer (Littler & Melanthiou, 2006). Moreover, the newer a product was perceived to be, the more likely consumers will view it as innovative (Lowe & Alpert, 2015).

Hedonic – and convenience motivation, time –, and price saving orientation:
When analyzing behavioral intention toward online food delivery services, Yeo, et al. (2017) note hedonic motivation as a factor that entails positive consumer attitude and intention to purchase. Additionally, consumers are noted to be more likely to use such services, when time is saved – this finding is especially applicable to consumers from the higher income brackets (Yeo et al., 2017). When faced with the choice of two competitors, consumers are also found to lean towards the cheaper alternative (Yeo et al., 2017). Lastly, the convenience factor of ordering food online is found to become increasingly relevant when applied to users with prior online purchase experience (Yeo et al., 2017).

Overall, consumer perceptions affecting consumer behavior are found to vary over time and be correlated to mood, risk averseness of respondents, affect, and the relevant knowledge on the topic, as well as bounded rationality (Littler & Melanthiou, 2006). Therefore, when offering their perspective on innovation, consumers might be biased and randomly attribute causality – for example, by liberally interpreting the presented evidence to confirm their views (Lowe & Alpert, 2015).

Non-users and adopters:
Naturally, the adoption of any innovation begins with the non-users' awareness of its existence. During the diffusion process information about the innovation is communicated among its users (Hernandez-Ortega, 2012). According to the author, the adoption of innovation consists of two stages. The pre-decision stage - in which the non-user collects information about the innovation and shapes their opinion on it accordingly, before deciding whether to adopt the innovation, or not – as well as the post-decision stage – in which the adopters strive to confirm their previous decision and continue, or discontinue their use of the innovation, accordingly (Hernandez-Ortega, 2012).

At this point, it is important to note that the above-mentioned concepts have different degrees of relevancy to adopters and non-users, respectively (Hernandez-Ortega, 2012). For non-

users, the most relevant concepts affecting their likeliness to adopt an innovation include perceived usefulness, - compatibility, and - security (Hernandez-Ortega, 2012). In this scenario, the authors note perceived ease of use as insignificant (Hernandez-Ortega, 2012). For adopters, the most concepts affecting their decision to continue using an innovation include perceived ease of use, perceived usefulness, and – compatibility. Perceived security does not significantly impact this measure (Hernandez-Ortega, 2012).

Consumer expectation for home delivery services:
Another important aspect affecting consumer behavior relevant to the scope of research of this thesis is consumer expectation for home delivery services. According to et al. (2016), consumers favor a slower delivery, rather than a more flexible, faster delivery at a higher rate. However, the possibility of choosing a specific date and time for the delivery, as well as high quality of service are strongly appreciated by consumers (Ghajargar et al., 2016). Therefore, one can see that consumer expectations are rather high, whilst their willingness to spend additional money on delivery options is rather low.

Consumer expectation of pharmacy encounters:
To better understand consumer expectations of pharmacy encounters, Renberg et al. (2011) split up consumers into two groups – group A, mainly concerned with the drug product, and group B, predominantly interested in personal support. Seven factors related to consumer expectation are thus extracted (Renberg et al., 2011). For group A, three factors are extracted. These included:

Factor 1 – independent drug shopping:
According to this factor, the accessibility of their medicine at the pharmacy is important to the consumers. Moreover, the consumers value short answers to questions regarding the medicine, by the pharmacist - they do not consider the pharmacist an in-depth counselor.

Factor 2 – logistics of drug distribution:
For consumers that respond well to factor 2, the logistics of supplying the correct medicine, at a good quality is essential. Apart from that, good accessibility and short waiting time are valued.

Factor 3 – supply of individuals' drugs
In regards to this factor, consumers want their medicine to be of good quality and delivered in a suitable package. Additionally, they feel pharmacies should not be business-oriented operations.

For group B, four more factors are extracted, however only the last factor – factor 7 is relevant to the scope of research of this thesis.

Factor 7 – practical healthcare and lifestyle support:
The exemplars of this factor desire support in terms of lifestyle issues from the pharmacy. Additionally, they rate accessibility factors – such as waiting times and opening hours – very highly.

The heterogeneity in consumer expectations is very well represented in this study. One can see the varying consumer needs for the same thing – in this case, their expectation of pharmacy encounters. It can be noted that the expected increase in quality through eHealth innovations is expected to have a positive impact on the willingness to adopt of group A consumers (Georgiev & Shtereva-Tzouni, 2020). From the extracted factors one can also note that both, group A and B consumers high levels of accessibility, which was mentioned as an additional benefit enabled by healthcare innovation by Georgiev & Shtereva-Tzouni (2020). Lastly, the need for support by the pharmacy was a factor to members of both groups – this has been mentioned before by Littler and Melanthiou (2006). Therefore, some sort of customer support system has to be considered when launching an online medication delivery platform.

2.2.2 Summary

Consumer behavior – and more specifically user acceptance of IT – can be influenced by many factors. Thus, Venkatesh et al. (2003) form four constructs that unify the many concepts of consumer behavior. These include:

- Performance expectancy - which encompasses perceived gains in job performance enabled by an innovation
- Effort expectancy – which comprises the ease of use of an innovation
- Social influence – which contains an individuals perception that others believe he or she should use an innovation
- Facilitating conditions – which comprises the belief that existing infrastructure supports the use of an innovation

Additionally, perceived risk and uncertainty, perceived innovativeness, consumer motivation, and time – and price savings orientation are mentioned as impactful factors to consumer behavior (Littler & Melanthiou, 2006; Lowe & Alpert, 2015; Yeo et al., 2017). To better understand consumer decision-making, Hernandez-Ortega (2012) notes the importance of differentiating between non-users and adopters. Thus, concepts driving non-users towards adopting an innovation are perceived usefulness, - compatibility, and – security. In contrast, adopters base their decision to continue to use an innovation on perceived ease of use, - usefulness, and – compatibility. Realizing these differences can enable a better understanding of the needs of one's target group. Moreover, literature on consumer expectations for home delivery services shows that consumer expectations are rather high, whilst their willingness to spend additional money is rather low (Ghajargar et al., 2016). Lastly, literature regarding consumer expectation

of pharmacy encounters provides the reader with the insight that consumer expectation regarding pharmacy encounters is rather heterogeneous. Thus, the consumers are split up into two groups – group A, consisting of consumers mainly concerned with the drug product, and group B, consisting of consumers interested in personal support. Although consumer needs vastly differ, high levels of accessibility, as well as the need for support by the pharmacy, are factors that are mentioned by members of both groups (Georgiev & Shtereva-Tzouni, 2020).

The consumers form one of the five stakeholder groups relevant to this thesis. The literature reviewed in this subchapter thus provides insight into the factors influencing consumer behavior, and – perception. As mentioned throughout this subchapter, achieving positive consumer perception is vital to any innovation's success – this finding is also expected to apply to the conceptualized medicine delivery platform of this research. Furthermore, the consumer behavior literature serves as the basis for the creation of the consumer survey discussed in the methodology chapter of this thesis.

2.3 Healthcare Innovation

2.3.1 eHealth

The term “eHealth” describes healthcare practices that are supported by electronic processes and communication. It is defined as “the use of information and communications technology (ICT) in support of health and health-related fields” (Szijártó, 2020). It encompasses mobile health – or mHealth – which depicts the use of mobile technologies for health-related purposes (Szijártó, 2020). Both eHealth and mHealth fall under the umbrella term “digital health” (Szijártó, 2020).

EHealth services cover an extensive range of applications throughout the healthcare system – these include electronic health records and an overview of medications, electronic health insurance cards, mobile apps, online pharmacies, and telemedicine (Georgiev & Shtereva-Tzouni, 2020; Montoya & Jano, 2020).

According to Szijártó (2020), digital health innovations have the potential to improve all domains of healthcare. These benefits include improved quality of care, increased cost efficiency, enhancing the base for health service delivery and policymaking, better resource allocation and -planning, real-time monitoring of the effect of a prescribed treatment on the patient, enabling the offering of increasingly personalized services to the consumer, allows for more accurate preventive measures through analysis of the previously collected data (Georgiev & Shtereva-Tzouni, 2020). In general, there is a consensus that eHealth and digital health have enormous potential in enhancing healthcare efficiency levels (Szijártó, 2020).

The concept of eHealth is linked to this thesis by way of the conceptualized online platform the research question revolves around. Therefore, such a platform combines the fields of ICT and healthcare.

eHealth literacy

To efficiently use eHealth innovations, all of the involved stakeholders must have sufficient levels of digital health literacy (Gray, 2011). According to Georgiev & Shtereva-Tzouni (2020), the main barrier hindering the use of eHealth services is low digital health literacy. The concept of eHealth literacy has been portrayed as a synthesis of six separate literacies – these include traditional -, computer -, health-, science-, information-, and media literacy (Gray, 2011).

Gray (2011) reports a deficiency in digital health literacy throughout the general population. A need to educate people and thus increasing their digital health literacy has been acknowledged by Gray (2011), Georgiev & Shtereva-Tzouni (2020), and Safafi & Kalis (2020).

The concept of eHealth literacy is relevant to this thesis as the stakeholders using the proposed platform need to be at least somewhat skilled in using eHealth solutions to operate it effectively.

2.3.2 Online Pharmacies

Online pharmacies are the leading category of the eHealth market and a part of the e-commerce sector. They offer the consumer the possibility to order both prescription – and non-prescription medicine on the internet. Montoya & Jano (2007) mention the rise of online pharmacies as one of the ramifications of the general rise in sales of consumer products on the internet.

According to Gray (2011), a sustainable future for pharmacies includes the use of an online platform. The author also mentions the value of exploring a combination of online – and offline presence for pharmacies (Gray, 2011). Especially for consumers of long-term medicines, online pharmacies display a persuasive future way of receiving their medication (Gray, 2011). Lastly, Gray (2011) mentions the provision of cognitive services, in addition to medicine. Additionally, Renberg et al. (2011) note the importance of understanding the heterogeneity of consumer expectations of pharmacy encounters, as well as the finding that the respondents' expectations of such encounters did not match current trends and regulations guiding pharmacy practice development.

Online Pharmacy Process:
Montoya and Jano (2007) mention a standard process a customer has to go through when ordering medicine at an online pharmacy. Firstly, the user opens an account on the pharmacy's homepage, where he submits his payment – and insurance information. Secondly, the customer must submit a valid prescription to the pharmacy – however, this step can be skipped if

the customer orders non-prescription medicine. Lastly, the online pharmacy has to verify the prescription before dispensing the medicine.

Some online pharmacies might allow the users to pick up their medicine at a local drug store, whilst others distribute the products to their customers from one central pharmacy (Montoya & Jano, 2007). Commonly, online pharmacies offer their customers to get in contact with them via e-mail or a toll-free cellphone number, in case of questions regarding the medicine (Montoya & Jano, 2007).

2.3.3 Advantages & Flaws

Online pharmacies offer substantial benefits to people with limited mobility – this includes disabled people, the elderly, and in general home-bound individuals – as they provide 24-hour availability, as well as home delivery (Montoya & Jano, 2007). Furthermore, Montoya and Jano (2007) mention the convenience factor, as well as an increased amount of information on the medication that is made available to the consumers through hyperlinks and search programs. These factors are also acknowledged by Gray (2011).

Montoya and Jano (2007) conducted their study in the United States of America, where online pharmacies – similarly to traditional pharmacies – have to be licensed in every state they operate in, which makes the licensing process of an online pharmacy significantly more complex than the one of a traditional pharmacy, as online pharmacies often have a consumer base expanding over more than one state (Montoya & Jano, 2007). Furthermore, consumers mentioned data - and privacy concerns as a major interference with their willingness to use online pharmacies (Montoya & Jano, 2007). Various risk factors – including the sale of unapproved medicine, the dispensing of prescription medication without a valid prescription, and false health claims in marketing – have also been mentioned by the authors (Montoya & Jano, 2007). These risk factors are especially important, as it is – due to the nature of the internet – incredibly hard to close down invalid, illegally operating online pharmacies (Montoya & Jano, 2007). This factor is also acknowledged by Gray (2011). Moreover, traditional pharmacies offer niche services to consumers that are yet to be offered online (Montoya & Jano, 2007). This factor is also acknowledged by Gray (2011). Finally, the immediate access to medicine when ordering it at an online pharmacy has been mentioned as a barrier, by the authors (Montoya & Jano, 2007), which has also been acknowledged by Gray (2011).

Additionally, Gray (2011) mentions the following benefits and drawbacks:

Benefits/Advantages	Risks/Disadvantages
Lower prices	Lack of pharmacy information

Added value through functionality like personal medication profiles	Additional fees
Possibility of price comparison	Volatile prices
Not limited by traditional pharmacy supplies	Damage to medicine through inadequate storage or delivery precautions
	Bypassing of the health professional-patient relationship
	Limited participation by third-party payers

TABLE 1: BENEFITS & FLAWS OF ONLINE PHARMACIES (GRAY, 2011)

Another important aspect of consideration is the logistical challenge posed by online pharmacies. Ghajargar, Zenezini, and Montanaro (2016) note that the ever-increasing number of small packages in shipments, as well as their high volatility, pose a tremendous challenge to logistics service providers. The researcher assumes this to get worse by the global spread of large-scale online pharmacies.

2.3.4 Why Healthcare Innovation is so Troublesome

Bhatti et al. (2018) argue that the healthcare industry has been banking on linear models of innovation for too long. This has, according to the authors, caused a lag in innovativeness, in comparison to other industries (Bhatti et al., 2018). Herzlinger (2014) acknowledged six forces that can drive, or kill healthcare innovation. These include:

Players:
If the innovator has been befriending big players in the healthcare industry, it will most likely increase the chance of the innovation becoming a success, whereas having enemies in the industry will most likely result in a lower chance of success for the innovation. Furthermore, one has to consider that the healthcare sector consists of many stakeholders, and each of them has different interests and goals – for example, doctors might blame technology-driven product innovators for the healthcare system's high cost. This often leads to competing interests within the sector.

Funding:
In healthcare, the processes of acquiring capital and generating revenue streams both differ in comparison to other industries. This is mainly due to the nature of healthcare innovation, but especially biotech innovation, where investors might have to wait a decade to establish whether a product will be approved for use or not. This factor has also been mentioned by Bhatti et al.

(2018), who additionally mention that the desire for short-lived breakthroughs often leads to favoring innovations with a high short-term return on investment over projects that might have a bigger positive long-term impact (Bhatti et al. 2018). Kielstra (2009) mentions that to overcome this issue, it is important for healthcare innovations to be viewed worthy to be pursued because of their positive impact on healthcare, rather than being basing judgment of innovations on a market-oriented approach.

Further complicators include the different reimbursement policies on the healthcare sector, as well as the necessary appeal of the product to doctors, who are in the position to recommend an innovation to their patients – which, in turn, are potential consumers to the innovator.

Policy:
Government regulation of the healthcare sector can both aid and hinder innovation in the sector – through incentives and limitations, respectively. Therefore, to maximize the potential of an innovation, the innovators need to understand the legal and regulatory framework of their market of interest.

Technology:
In the healthcare sector, technological innovation is significantly harder than in other sectors. This is due to many factors, including the short time frame for technological innovation – launch an innovation too soon and you might lack infrastructural support, launch an innovation too late and you might have missed out on gaining competitive advantage. Another factor is that technology innovation has not been matched by advances in healthcare management and processes (Kielstra, 2009).

Customers:
Consumers in the healthcare sector are becoming increasingly involved in managing their health. Besides lobbying to increase the pressure on the government regarding healthcare spendings, consumers also often pressurize healthcare providers to permit them access to treatments they consider effective. By collecting information from the internet, the consumers feel secure criticizing, or even disregarding medical information they do not agree with. According to Georgiev & Shtereva-Tzouni (2020), the main barriers hindering the use of eHealth services are privacy concerns, low levels of consumer trust, and low digital health literacy. Additionally, Littler & Melanthiou (2006) note the importance of understanding the impact of consumer uncertainty on their behavior.

All of the factors above, combined with the fact that consumer out-of-pocket expenses on healthcare are at an all-time high, it is important for the innovator to recognize the consumers' concerns and take advantage of the consumers' increasing empowerment.

Accountability:
Besides cost-effectiveness, consumers demand long-term safety from innovators. These

demands often overshadow government regulations in longevity and are to be met by the innovator to avoid public backlash.

Barriers to Innovation

Unless the above-mentioned forces are acknowledged, any of them can be a hindrance to innovation. However, according to Herzlinger (2014), to gain a deeper understanding of the different obstacles to innovation in the healthcare sector, we must split them up into three groups:

… in consumer-focused innovation:
Both, the absence of helpful industry players, as well as the existence of hostile ones can prohibit innovation. Considering that established players will most likely view innovation as a threat to their market share, one can see why consumer-focused innovation in the healthcare sector is particularly difficult. Additionally, under-developed consumer marketing, distribution channels, and intermediaries make it increasingly hard to effectively reach the potential customer base and make them aware of the innovation. Therefore, innovators should rather focus on meeting consumer wants in terms of effectiveness, safety, and efficacy. The funding for consumer-focused ventures can be especially onerous, as there is a lack of traditional healthcare investors with expertise in consumer products.

… in technology-based innovation:
To maximize the potential of technology-based innovation, the innovator must first understand and deal with the law and regulations applicable in the area of operations. Additionally, the innovator must collaborate with insurance companies in advance of launching the product, to ensure that the innovation will be eligible for reimbursement. Furthermore, the innovator must also consider the economics of healthcare providers and insurers and the relationship among them. An additional challenge for technology-based innovations is the communication of the long-term monetary benefits of the adaption of the innovation to potential buyers. Insurers often only realize the cost associated with the implementation of new technology, not the long-term savings. Additional barriers to technology-based innovation include personal preference and bias. Accordingly, even if the innovation offers a more effective treatment whilst saving money, the potential customer might still prefer another technology.

… in business-model innovation:
Similar to consumer-based innovation, the innovator might face hostility from industry players that perceive the innovation as a competitive threat to them.

Generally, Bhatti et al. (2018) mention a struggle in identifying problems, projects, or ideas and ranking them accordingly. According to the authors, a lack of proven criteria for project selection in combination with the issue of balancing social impact with good monetary returns puts a burden on the process of innovation in healthcare (Bhatti et al. 2018). Other issues mentioned by the authors include scoping and resourcing projects accordingly, as well as killing a project off if

need be and establishing appropriate performance metrics for each innovation (Bhatti et al., 2018). Finally, the authors mention the importance of identifying the varying types of support a project might require to transition to the next phase (Bhatti et al., 2018). Additionally, Szijártó (2020) notes that digital health products have to be validated from various perspectives – including privacy -, technical -, economic -, and clinical aspects, as well as their usability.

Overcoming Barriers

To overcome the barriers mentioned above Herzlinger (2014) mentions the increasing importance of consumer focus when it comes to healthcare innovations. To meet consumer wants, innovators have to offer convenient, relatively low-cost, effective innovations to their potential customers (Herzlinger, 2014). This can be achieved by innovating the way consumers buy and use healthcare, innovating technology, products, or treatments to improve care, or by generating business models that involve either horizontal – or vertical integration of isolated healthcare organizations or – activities. Additionally, Safafi & Kalis (2020) note the importance of building consumer confidence by prioritizing privacy, security, and trust measures. Finally, by increasing the health literacy and digital competence of the general public and making healthcare innovation accessible to people from as many social backgrounds, as possible the potential of digital health innovations can further be amplified (Safafi & Kalis, 2020, Littler & Melanthiou, 2006).

Bhatti et al. (2018) are in agreement with Herzlinger (2014) when it comes to the need of adopting new ways of innovation, such as co-creation and human-centered design, to meet consumer needs more accurately. Furthermore, the authors mention the importance of identifying a purpose that consolidates efforts and subsequently participating only in activities that advance the project accordingly (Bhatti et al., 2018). To maximize stakeholder engagement, Bhatti et al. (2018), endorse the implementation of co-creation methods. Safafi & Kalis (2020) mention the importance of meeting the doctors' needs by fitting innovations into clinical practice. Other suggestions include enlisting project managers and assigning clear roles and responsibilities to all of the involved stakeholders, as well as setting a fitting budget and scope for each project, which has to be aligned with funds and horizons (Bhatti et al., 2018). Finally, the authors propose the establishment of clear operational – and performance metrics, as well as the revision of said metrics, as the project evolves (Bhatti et al., 2018).

Kielstra (2009) mentions five areas of system innovation in healthcare:

Sharing information:
In outcomes-based healthcare, it is inevitable to know what treatments are effective in certain situations. This can best be achieved by sharing information on the outcome of said treatments inter-organizationally.

Introducing outside entrepreneurship to healthcare:
As already acknowledged by Herzlinger (2014), innovations in the healthcare sector are often

blocked because they pose a threat to an established player. However, to maximize the healthcare sector's potential, these ideas should rather be judged on their medical potential. Additionally, the conservatism that can be found embedded in the mindset of many executives and leaders in the healthcare sector was mentioned by the author as another hindrance to innovation.

Delivering integrated care based on medical conditions, rather than provider expertise:
Fragmented healthcare systems hinder consumer-centric healthcare. This argument for a consumer-centric approach has already been mentioned by Herzlinger (2014) and Bhatti et al. (2018), above and has further been confirmed to have a significant impact on understanding consumer wants by Safafi & Kalis (2020). However, the author mentions the example of the West German Headache Center, which offers consulting by experts from various fields that all work within one facility and collaboratively diagnose and recommend treatments accordingly. Collaborative efforts such as this one not only lower the costs of the healthcare system but also meet consumer needs in an improved way. Moreover, the author found incentive structures to regularly not reward innovation in the healthcare sector adequately. To foster innovation, this has to be revised.

Treating the consumers as a source of innovation:
Over the last few decades, businesses in many sectors have realized the benefits of using their consumers' opinions as a source of innovation. The healthcare sector, however, has been hesitant to adopt this approach, due to the perceived risks of spreading medical information online. Nowadays, however, social networks have changed the way consumers can inform each other about conditions and treatments they have experienced – these consumers are also called "e-patients". This could potentially facilitate a more market-driven system, which enables the consumer to make informed choices about products, services, and treatments. Therefore, it would be of great benefit to the healthcare sector to realize the potential consumer opinion has as a source of innovation.

Combine the above-mentioned ideas:
To maximize the benefit of the above-mentioned approaches they should be used simultaneously.

2.3.5 Internet of Things in the Pharmaceutical Industry

The Internet of Things – or IoT in short – was founded in 2012 and built upon the previous development of the so-called "web tech 3.0" (Singh, Sachan, Singh, & Singh, 2020). Ever since then, it has been one of the fastest-growing technologies of the 21st century (Singh et al., 2020). The predominant areas of use for the IoT include smart applications (35%), as well as smart healthcare devices (13%) (Singh, Sachan, Singh, & Singh, 2020). It includes both hardware – and software and enables information sharing within a network of devices (Singh et al., 2020). By

enabling these devices to transfer data wirelessly and introducing automation systems to control them, the required human effort can be dramatically reduced (Singh et al., 2020).

In the pharmaceutical industry, IoT can be used to collect health data, which can be used to adapt the treatment accordingly, over time (Singh et al., 2020). Additionally, medicine distribution can be recorded (Singh et al., 2020). Through the use of Radio Frequency Identification (RFID) technology, medicine deliveries can be monitored and tracked in real-time, which enables online medicine purchasing (Singh et al., 2020). Another potential benefit to RFID technology lies in the improvement of manufacturing and supply chain processes in terms of effectivity, as well as security (Singh et al., 2020). This upside is to be considered especially in the pharmaceutical industry, as supply chain processes have to be handled extremely carefully, to ensure that the consumer receives the correct dosage of the prescribed medicine (Singh et al., 2020). Finally, the authors mention that IoT offers the possibility of interconnecting medicine, marketing, and pharmaceutical companies, which could have a positive impact on the most under-developed marketing strategies in the healthcare industry mentioned by Herzlinger (2014).

2.3.6 Digital Platform Innovation

In recent decades, online platforms have become increasingly relevant in the business environment (Trabucchi & Buganza, 2019). The basic idea of such platforms is to connect two or more parties, who are searching for each other (Trabucchi & Buganza, 2019). The platform paradigm encouraged many corporates to open up to new directions of innovation (Trabucchi & Buganza, 2019). Additionally, platforms offer zero marginal cost mechanisms, as well as an unmatched pace of up-scaling and spreading globally to start-up companies (Trabucchi & Buganza, 2019). In their 2016 technological trends report Accenture predicts that, across industries, a wave of future disruptive innovation will arise from platform-driven ecosystems (Accenture, 2016 in Trabucchi & Buganza, 2019).

In general, digital platforms can be either two-sided or multi-sided (Trabucchi & Buganza, 2019). The difference lies in the number of groups connected through the platform – Uber for example is two-sided, as it connects drivers to consumers (Trabucchi & Buganza, 2019).

According to Trabucchi and Buganza (2019), platform innovation can be promoted through two main strategies:

Supply-side extension:
The main goal of this strategy is to identify additional transactional sides that may be linked to the initial one and thus, harness customer value gained from the first transactional side to build a new transactional side, based on the original one (Trabucchi & Buganza, 2019). A good example of this is the “Uber Eats” service launched in 2015 by Uber. By offering this service, Uber started using its drivers to link its consumers to restaurants (Trabucchi & Buganza, 2019).

Trading data:
The data collected from the platform's users can be used to foster further innovation and, in turn, expand the business (Trabucchi & Buganza, 2019). Continuing on the example of Uber, a service called "Uber Movement" was launched in 2017. Through Uber Movement, data from the initial service of matching drivers with consumers is collected and used to improve urban planning (Trabucchi & Buganza, 2019).

By using one – or both – of these strategies, the business launching an innovative digital platform can overcome the very common chicken and egg paradox, by utilizing the value embedded in the first transactional side of their innovation to create further transactional sides (Trabucchi & Buganza, 2019).

2.3.7 Summary

As a part of the umbrella term digital health, eHealth services cover an extensive range of applications throughout the healthcare system – these include electronic health records and an overview on medication, electronic health insurance cards, mobile apps, online pharmacies, and telemedicine (Georgiev & Shtereva-Tzouni, 2020; Montoya & Jano, 2020). Benefits arising from digital health innovations can be seen in all domains of healthcare and include improved quality of care, increased cost efficiency, and more (Szijártó, 2020). In general, there is a consensus that digital health tools have the potential to greatly enhance healthcare efficiency levels. The most prominent representative of the eHealth market is online pharmacies. The advantages and flaws of online pharmacies are weighed in this chapter and the process of ordering medicine online is described (Gray, 2011). Subsequently, the many barriers to healthcare innovation are discussed. Proposals to overcome those barriers are presented, and the role of the IoT in the pharmaceutical industry, as well as two different approaches to digital platform innovation, are discussed. Overall, this subchapter forms the basis for the expert interviews described in the methodology chapter of this research and informs the reader about the troublesome healthcare framework that makes innovation incredibly cumbersome, whilst also providing possible solutions to the issues discussed.

2.4 State of Play & Adoption Rates

2.4.1 The Digital Divide & Consumer Interest in Virtual Healthcare

The globally apparent issue of a digital divide between low – and high-income households, as well as between the younger – and the older part of the population became ever so clear during the COVID Crisis (Safafi & Kalis, 2020). Safafi & Kalis (2020) report that during the crisis patients belonging to the younger part of the population received virtual healthcare more than twice as often as patients from the older generations.

In terms of consumer interest in virtual healthcare – or V-Care for short, the authors report that consumers already showed considerable interest pre-COVID (Safafi & Kalis, 2020; Szijártó, 2020). Participants of the study were also found to be open to receiving virtual healthcare services from companies operating in the technology sector. The authors expect this finding to become increasingly important as the digital natives come of age (Safafi & Kalis, 2020).

Szijártó (2020) reports a continuous rise in consumer usage rates of mobile health apps – within 4 years the share of consumers using such applications rose by 32 percent-points from 16% in 2014 to 48% in 2018. The author interprets this substantial increase to be promoted by the increasing awareness levels of limited resources in healthcare, as well as the large amount of new digital health products introduced to consumers during this time frame (Szijártó, 2020). Keeping in mind the projected number of 3.8 billion smartphone users by 2021, a further increase in consumer adoption of digital healthcare tools is to be expected (Szijártó, 2020).

2.4.2 Digital Health during COVID-19

To this day, the COVID-19 pandemic makes the use of virtual healthcare a necessity all around the globe (Safafi & Kalis, 2020; Szijártó, 2020). Throughout the pandemic, the indispensable transition towards using more digital health devices has positively impacted consumer attitudes towards digital health, in general (Szijártó, 2020). Digital health devices and – services have been used to facilitate public health through tracking and monitoring the population, and aid infection risk assessment (Szijártó, 2020). Additionally, digital health services have helped to limit the impact of the pandemic by decreasing the need for in-person doctor visits (Szijártó, 2020).

Post-COVID, consumer expectations are expected to increase significantly. To promote long-term use of digital health, these expectations have to be met by the providers (Safafi & Kalis, 2020).

2.4.3 Online Pharmacies

Over the last two decades buying medicine online has become increasingly more common (Gray, 2011). This trend was further accelerated by the COVID-19 crisis (Szijártó, 2020). Gray (2011) notes an interesting difference in willingness to order medicine online between different age groups. More specifically, the author states that, in general, adolescents were hesitant to buy medicine from an online pharmacy, even though they reported to have ordered other products online before the study (Gray, 2011). According to the author, this was found to be due to their compliance with safety standards (Gray, 2011). In contrast participants of the study aged 18-25 displayed greater interest in buying from online pharmacies offering solely non-prescription medicine, which was confirmed by a study conducted in Belgium that showed greater acceptance levels of online sales of non-prescriptive medicine amid consumers younger than 45 (Gray, 2011).

Regulatory issues concerning online pharmacies are however still holding back the development and large-scale implementation of online pharmacies (Montoya & Jano, 2007). Besides the mostly burdening nature of government regulations on innovations, such as online pharmacies, these regulatory issues can also foster distrust amongst potential customers (Montoya & Jano, 2007). This finding has also been acknowledged by Georgiev & Shtereva-Tzouni (2020).

2.4.4 Digital Health Investment

Digital technologies are increasingly impactful in transforming many industries, including healthcare (Szijártó, 2020). And even though the digital health industry is still lagging behind other industries in terms of efficient innovation adoption, venture capital investment in digital health grew 1000-fold over the last decade (Szijártó, 2020). In 2019, start-ups operating in the digital health sector raised $ 10.6 billion, with 60% of the investors being repeated investors, which is a good indicator for the majority of this industry (Szijártó, 2020). As the author mentions their positive impact on healthcare efficiency, as well as the benefits of open innovation and knowledge sharing, Sziijártó (2020) acknowledges digital health innovators as important elements of the ecosystem.

2.4.5 (Digital) Health in Austria

Health status:
In the country health profile published by the OECD (2019), 70% of Austrians reported good health. Life expectancy was found to be 0.8 years higher, in comparison to the EU average in 2017 (OECD, 2019). However, relative to the EU average, Austrian citizens were found to live more years of their lives suffering from chronic diseases and disabilities (OECD, 2019). Disparities in life expectancy exist by gender, as well as socioeconomic status – however, inequalities in both are lower than the EU average (OECD, 2019).

The OECD (2019) projects a rise in public spending on health care and long-term care by 1.3 percent points of the GDP, and 1.9 percent points of the GDP, respectively. Future structural reforms might be essential to ease the adaption of new potential challenges faced by the Austrian healthcare system (OECD, 2019).

Effectiveness:
When it comes to measures of effectiveness, Austria's healthcare system is mostly operating around the mean value of the EU (OECD, 2019). Most noticeably, the number of avoidable hospitalization remains comparatively high and pharmaceutical spending efficiency seeks improvement (OECD, 2019). Both of these factors contribute to a relatively high health expenditure per capita and annum of € 3.900 – which is roughly € 1.000 above the EU average (OECD, 2019).

Austria's health benefits were found to be marginally more comprehensive when compared to the EU average, as its coverage is near-universal and healthcare is easily accessible (OECD, 2019). Whilst primary care improvements, as well as the correction of the above-mentioned imbalances, are at the core of recent reforms, the Austrian healthcare system remains comparatively fragmented, which leads to dispensable inefficiencies (OECD, 2019, Georgiev & Shtereva-Tzouni, 2020). Georgiev and Shtereva-Tzouni (2020) view eHealth innovations as a real opportunity to improve healthcare efficiency, accessibility, and quality, all whilst saving money. The use of information and communication technology in eHealth is mentioned as a powerful tool enabling effective eHealth innovation by Georgiev and Shtereva-Tzouni (2020). Furthermore, the authors mention the importance of national health reforms that better integrate the patient perspective to foster eHealth innovation (Georgiev & Shtereva-Tzouni, 2020).

Risk factors:
Poor diets, in combination with above-average rates of smoking, and alcohol consumption remain at the heart of the main risk factors to the Austrian health status (OECD, 2019). It is especially concerning that Austria is one of the few countries in the EU where smoking rates have not declined over the past two decades (OECD, 2019). Another notable risk factor is the lack of physical activities reported by Austrian adolescents (OECD, 2019). Additionally, the aging population remains a challenge to the Austrian healthcare system that is also faced by most EU states (OECD, 2019).

Support for digital health start-ups in Austria:
One of the most prominent supporters of digital health startups in Austria is the Health Hub Vienna (Szijártó, 2020). The health hub supports open innovation by connecting stakeholders from the pharmaceutical industry, insurances, healthcare suppliers, and medical device manufacturers with start-ups (Szijártó, 2020). Furthermore, it offers an accelerator program organized by the IniTS Universitäres Gründerservice Wien GmbH, which is an incubator that supports the start-ups' growth (Szijártó, 2020).

Strengths and barriers of the Austrian healthcare system in terms of eHealth:
Szijártó (2020) notes the electronic health record system "ELGA" as a source of high-quality data that could be used as a basis for prioritizing and validating eHealth innovations (Szijártó, 2020). However, as mentioned above the outdated and largely fragmented legal framework often hinders innovation. And even though extensive evidence of the cost-effectiveness of eHealth solutions is still limited, institutions such as the Health Hub Vienna, as well as research and development activities of universities can form an excellent basis for effective innovation (Szijártó, 2020). Additionally, the high digital literacy of Austrians can be expected to positively impact their willingness to adopt digital health innovations (Szijártó, 2020). Lastly, the author mentions the possible resistance of doctors as one of the main barriers to innovations in the healthcare sector. This argument is underlined by Safafi & Kalis (2020) who argued that

convincing doctors of the potential benefits of digital health for their patients, will have a noticeable impact on adoption rates.

2.4.6 Summary

This subchapter discusses the current state of digital health – and more specifically eHealth and online pharmacies – globally. Additionally, the digital divide, as well as the impact of the COVID-19 pandemic on digital health adoption rates, are discussed. The significant growth in digital health investment is subsequently presented to the reader. Lastly, the state of play of digital health, as well as the health status in Austria, are discussed. Therefore, the effectiveness of the healthcare system in Austria, as well as risk factors to it are mentioned. Moreover, the support for digital health start-ups in Austria, and the strengths and barriers of the Austrian healthcare system in terms of eHealth are discussed. A lack in terms of digital health literacy throughout the general population is mentioned by Gray (2011). Moreover, it is important to note that the digital divide between low- and high-income households, as well as between the younger – and the older part of the population became more apparent than ever during the COVID-19 crisis. Moreover, the pandemic made the use of digital health tools a necessity, which led to a significant increase in adoption rates, as well as a more positive consumer attitude towards digital health in general (Szijártó, 2020). Gray (2011) mentions that buying medicine online has become more common over the last two decades. This trend has been further accelerated through the COVID-19 pandemic, however, regulatory issues still hold back the large-scale development of online pharmacies (Montoya & Jano, 2007). Another important finding from this subchapter is that digital health investment is still on the rise after growing 1000-fold over the last decade. Regarding the Austrian healthcare system, key performance indicators show that it is operating around the mean value of the EU. However, effectiveness levels can still be optimized – Georgiev and Shtereva-Tzouni (2020) hereby mention eHealth innovations as a real opportunity for improvement. Above-average rates of smoking, and alcohol consumption, as well as an aging population pose a risk to the Austrian health status (OECD, 2019). Notably, Vienna is slowly but surely becoming a digital health hub with accelerator programs, as well as incubators supporting start-ups in the sector. ELGA is mentioned as a basis for prioritizing and validating eHealth innovations. However, digital health innovation is often still hindered by the outdated and largely fragmented legal framework in place. And even though extensive evidence regarding the cost-effectiveness of eHealth solutions is limited, the support systems in place form an excellent basis for effective innovation. Furthermore, the comparatively high levels of digital literacy found in Austria are expected to positively impact the population's willingness to adopt digital health innovations (Szijártó, 2020). In addition to providing the reader with the information mentioned above, this subchapter also forms the basis of the expert interviews conducted in the empirical part of this research.

3 METHODOLOGY

3.1 Research Design

This research is based on the epistemological approach of social constructivism. This theory of knowledge in sociology and communication theory explores the knowledge and understandings of the world that are jointly developed by humans (Amineh & Asl, 2015). According to the authors, social constructivism consists of two main elements – a) "the assumption that human beings rationalize their experience by creating a model of the social world and the way it functions", and b) "the belief in language as the most essential system through which humans construct reality" (Leeds-Hurwitz, 2009 in Amineh & Asl, 2015). Additionally, social constructivism is based on specific assumptions about reality, knowledge, and learning. Firstly, it is assumed that reality does not exist in advance but rather is constructed through human activity. Therefore, in the construct of social constructivism, reality can be discovered by individuals through social invention. Secondly, knowledge is regarded as a socially and culturally constructed human product. Thus, individual meaning can be created through interaction within a certain environment. Lastly, learning is viewed as a social process. Therefore, learning occurs when individuals are engaged in social activities, rather than individually (Amineh & Asl, 2015). The theory of social constructivism fits the research topic best, as this research aims at explaining stakeholder perception of an innovation that has the potential to affect the lives – and therefore construct the reality – of many individuals.

3.2 Research Strategy

The research strategy is based on a linear research design which is visualized in Figure 1. The research process starts with a comprehensive literature review which prepares the conceptual framework and the underlying hypotheses.

FIGURE 1: FLOWCHART

After a solid revision of concepts (see Figure 1) the research approach is selected. This thesis follows a mixed-methods approach consisting of two primary research methods. The primary research is administered by way of expert interviews and a questionnaire-based consumer survey. This approach was chosen by the researcher firstly, due to the nature of the research question, which aims to present a complete picture including perspectives from all of the stakeholders involved, and secondly due to the possibility of combining the strengths of qualitative and quantitative research methods (Creswell, 2006). To conduct both, the consumer surveys, as well as the expert interviews, a time frame from January 2021 to February 2021 is decided upon.

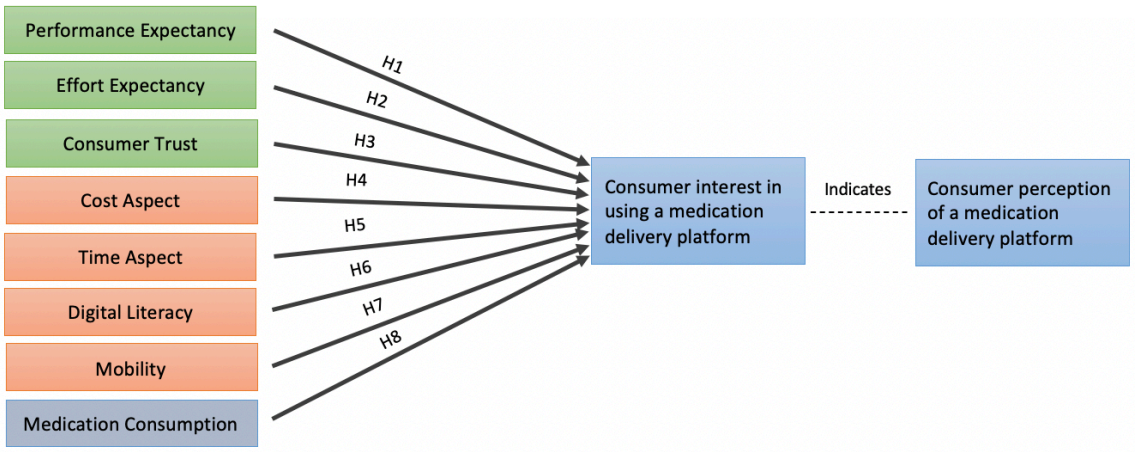

FIGURE 2: CONCEPTUAL FRAMEWORK OF CONCEPTS INCLUDED IN HYPOTHESES

To better visualize the relevant underlying concepts of this thesis, the conceptual framework is split up into two parts. The first part (figure 2) depicts only the concepts from which hypotheses are developed. In the green boxes, one can see the concepts of performance expectancy, effort expectancy, and consumer trust, which are extracted from consumer behavior-related literature. The orange boxes – including cost aspect, time aspect, digital literacy, and mobility – are extracted from the literature regarding healthcare innovation. The grey box represents the medication consumption by the consumer, of which the researcher expects an impact on consumer

interest in using a medication delivery platform, even though it was not previously mentioned in the literature. All of the boxes on the left side of the conceptual framework represent independent variables, whereas the blue boxes on the right represent the dependent variable "consumer interest in using a medication delivery platform" as well as the consumer perception of a medication delivery platform. The arrows represent the developed hypotheses H1 through H8 whilst the dotted line serves as the visualization of the assumption that the variable "consumer interest in using a medication delivery platform" indicates consumer perception of a medication delivery platform.

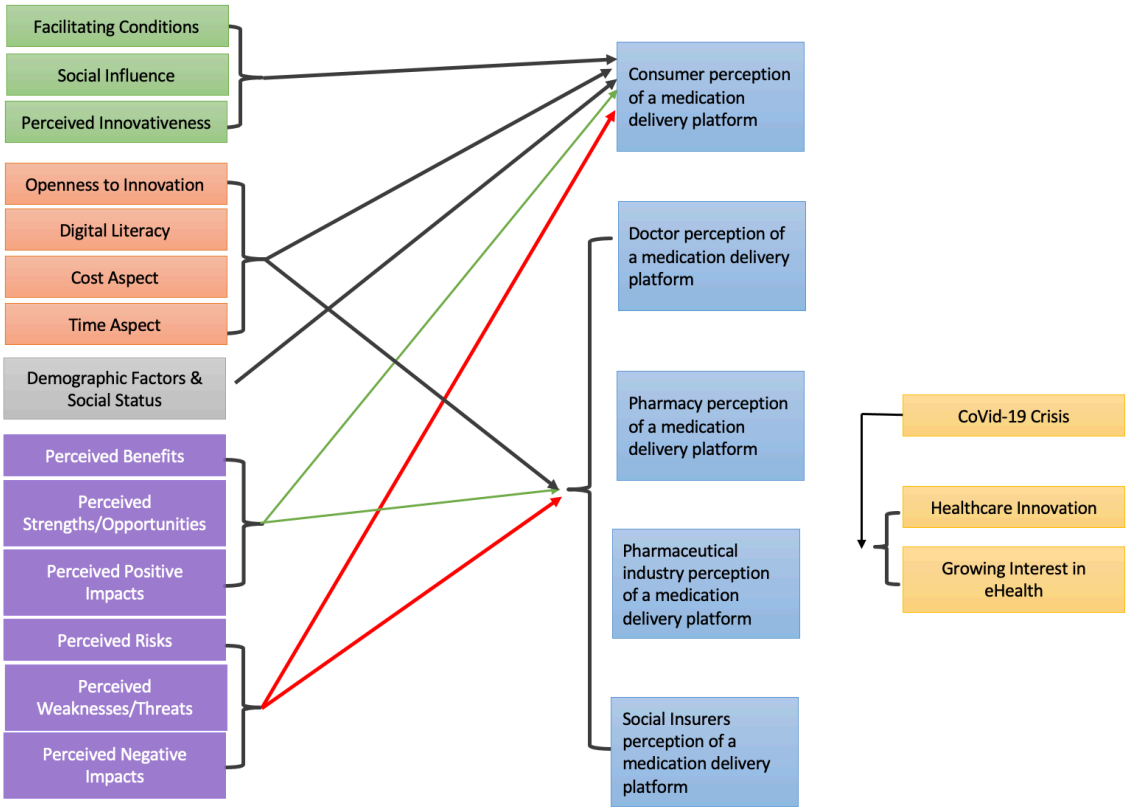

FIGURE 3: CONCEPTUAL FRAMEWORK OF CONCEPTS NOT INCLUDED IN HYOPOTHESES

The second part of the conceptual framework (figure 3) visualizes concepts from the literature from which no hypotheses are developed. Rather, these concepts are used to develop questions for the expert interviews. In this part of the conceptual framework, arrows do not represent hypotheses but rather which of the stakeholder perceptions the concepts are expected to impact. Once again, the green boxes represent concepts extracted from consumer behavior literature – these are facilitating conditions, social influence, and perceived innovativeness – the researcher expects these concepts to impact only consumer perception of a medication delivery platform. In the orange boxes, one can see healthcare innovation-related concepts – namely openness to innovation, digital literacy, cost aspect, and time aspect – these concepts are expected to impact all of the stakeholders' perceptions. Even though there is no previous literature on this specific correlation, demographic factors and social status are expected to impact only

consumer perception of a medication delivery platform. The concepts in the purple boxes are extracted from healthcare innovation-related literature, however, in contrast to the concepts visualized in the orange boxes, these concepts focus on stakeholder perceptions. Thus, perceived benefits, - strengths and opportunities, as well as - positive impacts are expected to positively influence all of the stakeholders' perceptions – thus the arrows are green. In contrast, perceived risks, - weaknesses and threats, and - negative impacts are expected to negatively influence the stakeholder's perceptions – thus the arrows are red.

The following paragraph provides further insights into the primary research tools used for this thesis. Subsequently, the research tools are explained and discussed in terms of their benefits, disadvantages, and usability.

3.2.1 Consumer Survey

A consumer survey is selected as the first instrument of primary research for this thesis. According to Creswell (2014), consumer surveys are primarily used for the quantitative analysis of attitudes, trends, or opinions. In general, a survey needs to address a specific target population and the researcher selects a sample from which conclusions can be drawn to the overall population. In the case of this research, the sample is not big enough to conclude the general population. Therefore, the surveys are used to gain a vague understanding of the consumer perception of a medication platform. To ensure the research offers a meaningful outcome still, expert interviews are conducted – these will be discussed below. In comparison to other research instruments, consumer surveys are relatively cheap and easy to administer. The quantitative data gathered from a survey allows for rather objective analysis and interpretation. Another benefit of survey research is the generally high possibility for generalization and reliability. However, an increased risk of invalid answers due to lacking knowledge about the subject of research by the respondents has to be noted (Blackstone, 2012). Traditionally, surveys are conducted face to face using pen and paper. However, nowadays surveys can also be conducted online. Due to the ongoing COVID-19 pandemic, as well as the increased ease of use of computer-assisted survey methods, the researcher chooses to combine the two approaches for this thesis. Therefore, the consumer survey is administered online, as well as face-to-face at multiple pharmacies in Vienna. However, even responses gathered at local pharmacies will be entered into a Google Forms document. This is expected to enhance responses, as the respondents do not have to physically touch a pen or paper. Furthermore, the subsequential data analysis process is more efficient, as the data can directly be exported from Google Forms into an Excel sheet and the data processing software PSPP. Generally, a survey can consist of two types of questions – open-ended and closed questions. Open-ended questions allow the respondent to freely answer a question in a qualitative manner, whilst closed questions present the respondent with pre-determined answers to choose from (Blackstone, 2012). Thus, closed questions are usually faster and more easily to answer for the respondent. Furthermore, closed questions can be analyzed more efficiently, as they present the researcher with quantitative data. In contrast, open-ended

questions offer the researcher deeper insights into the respondents' opinions on a subject but are rather tedious during the data analysis process, as each answer is unique, and therefore has to be interpreted by the researcher.

The survey used for this thesis consists of 24 closed questions and one open-ended question that serves the purpose of further elaborating on a previously asked closed question. The respondents are sampled via convenience sampling in both, the online – and offline format of the response. This approach is chosen to obtain a large number of respondents within the restricted time frame of the research. The questionnaire is drafted in German and subsequently translated into English. It was approved by the Institutional Review Board of Modul University Vienna before being used. The questionnaire is split up into three parts – namely the introduction to the topic and the consent for participation, as well as a scenario, demographical questions, and questions regarding the topic of interest. It consists of dichotomous, nominal, ordinal, and Likert scale questions. The questions are sequenced in a way that more general questions are asked in the beginning, whereas more specific questions are asked at the end. To ensure respect for the ethics of research, respondents can anonymously take part in the survey. Furthermore, all of the recorded data is password protected and will be deleted by June 2021.

To enhance responses, a large part of the consumer surveys are done face-to-face in front of pharmacies around Vienna. Furthermore, respondents are asked to put themselves into a specific scenario. In this scenario, respondents are at their local doctor's office getting a prescription for medication. Subsequently, the doctor asks them if they want to pick up their medication on their own from their local pharmacy, or if they want to have their medication delivered to their home, on the day of the doctor's appointment, by using a medication delivery platform. Respondents are thereafter asked to think of factors that might influence their decision in the said scenario and answer the questions asked within the questionnaire accordingly. Additionally, potential respondents for the convenience sampling are contacted directly via e-mail or a telephone call. This bares the ethical issue of perceived pressure to answer questions in a way they are perceived as beneficial to the researcher. However, the respondents are asked to answer truthfully before opening the questionnaire.

The collected response data is analyzed in SPSS to statistically test the determined hypotheses. Firstly, a descriptive analysis is conducted to obtain a better understanding of the data in terms of frequencies, means, and standard deviation. Secondly, a two-tailed approach is used for the correlation tests, as the direction of the correlation is unknown for all of the variables.

Survey-based Hypotheses

In the context of this research, the variables relevant to the hypotheses are derived from the consumer survey. Thus, eight hypotheses were formulated to examine potential correlations between relevant variables. All of the eight hypotheses focus on the impact of different factors on consumer perception of a medication delivery platform.

Survey-Hypothesis 1: The first survey-based hypothesis analyzes the correlation between the concept of performance expectancy and consumer perception of a medication platform. The null hypothesis (H_0) states that there is no significant relationship between the variable "perceived usefulness" and "general interest in using a medication delivery platform". The alternative hypothesis (H_1) states that a significant relationship between the variable "perceived usefulness" and "general interest in using a medication delivery platform" exists. The hypothesis is supported by literature discussed in subchapter 2.1.1 concerning user acceptance of Information Technology.

Survey-Hypothesis 2: The second survey-based hypothesis is concerned with the correlation between the concept of effort expectancy and consumer perception of a medication platform. The null hypothesis (H_0) states that there is no significant relationship between the variable "easy to use" and the variable "general interest in using a medication delivery platform". The alternative hypothesis (H_1) states that a significant relationship between the variable "easy to use" and the variable "general interest in using a medication delivery platform" exists. This hypothesis is also supported by literature discussed in subchapter 2.1.1 concerning user acceptance of Information Technology.

Survey-Hypothesis 3: As discussed in subchapter 2.2.4 gaining consumer trust is one of the most important objectives, when wanting to achieve mass adaption of eHealth services. Therefore, the third survey-based hypothesis examines the correlation between consumer trust and consumer perception of a medication delivery platform. The null hypothesis (H_0) states that there is no relationship between the variables "consumer trust" and "authenticity", and the variable "general interest in using a medication delivery platform". The alternative hypothesis (H_1) states that a relationship between the variables "consumer trust" and "authenticity", and the variables "general interest in using a medication delivery platform" exists.

Survey-Hypothesis 4: As reviewed in subchapter 2.2.4, to meet consumer needs innovators have to offer low-cost innovations to potential customers. Subsequently, the fourth survey-based hypothesis investigates the relationship between the perceived cost of usage and consumer perception of a medication delivery platform. The null hypothesis (H_0) assumes that there is no correlation between the variables "cost aspect" and "general interest in using a medication delivery platform". The alternative hypothesis (H_1) states that there is a correlation between the variables "cost aspect" and "general interest in using a medication delivery platform".

Survey-Hypothesis 5: Subchapter 2.1.1 discusses the effect of time savings on consumer perception of online delivery services. Accordingly, the fifth survey-based hypothesis analyzes the correlation between perceived time savings and consumer perception of a medication delivery platform. The null hypothesis (H_0) states that there is no correlation between the variables "time savings" and "general interest in using a medication delivery platform". The alternative

hypothesis (H_1) assumes that a correlation between the variables “time savings” and “general interest in using a medication delivery platform” exists.

Survey-Hypothesis 6: As reviewed in subchapter 2.2.4, low levels of digital literacy can be one of the main hindrances of mass adoption of digital health innovations. Therefore, the sixth hypothesis tests the relationship between digital literacy and consumer perception of a medication delivery platform. The null hypothesis (H_0) assumes that there is no correlation between the variables “smartphone use”, “laptop use” and “use without digital devices”, and “general interest in using a medication delivery platform”. The alternative hypothesis (H_1) states that a correlation between the variables “smartphone use”, “laptop use” and “use without digital devices”, and “general interest in using a medication delivery platform” exists.

Survey-Hypothesis 7: Additionally, the correlation between medicine consumption and consumer perception of a medication delivery platform is investigated. This potential correlation is not discussed in the literature, however, the variables are hypothesized to be significantly correlated by the researcher, in the seventh hypothesis. Therefore, the null hypothesis (H_0) assumes that there is no correlation between the variables “regular medication consumption”, “prescription medicine consumption” and “regularity of consumption of medicine”, and “general interest in using a medication delivery platform”. The alternative hypothesis (H_1) states that a correlation between the variables “regular medication consumption”, “prescription medicine consumption” and “regularity of consumption of medicine”, and “general interest in using a medication delivery platform” exists.

Survey-Hypothesis 8: Subchapter 2.2.3 describes the benefits of online pharmacies to people with limited mobility. Accordingly, the eighth hypothesis discusses the correlation between consumer mobility and consumer perception of a medication delivery platform. The null hypothesis states that there is no correlation between the variables “mobility” and “others pick up medicine for me”, and the variable “general interest in using a medication delivery platform”. The alternative hypothesis assumes that there a significant correlation between the variables “mobility” and “others pick up medicine for me”, and the variable “general interest in using a medication delivery platform” exists.

3.2.2 Expert Interviews

To deeply explore the opinions and perspectives of the different stakeholder groups on this thesis’ subject, in-depth interviews – more specifically expert interviews are selected as one of the two primary research tools. This allows the researcher to gather background information and recognize different stances on the topic (Guion, Diehl & McDonald, 2011). Additionally, conducting expert interviews allows the researcher to get a better understanding of the status quo of digital health innovations and potential enhancements to it, from the different stakeholder perspectives. The goal is to interview at least one expert representing each of the stakeholders and

then compare the different opinions on the topic. This is expected to add tremendous value to the research, as it provides previously unknown information to the researcher and completes the data obtained throughout the other parts of the research.

Before further discussing the nature of the interviews conducted for this thesis, it has to be noted that expertise is a term defined as “the combination of knowledge, experience, and skills held by a person in a specific domain” (Germain & Ruiz, 2008).

According to Ericsson & Smith (1991), the status of experts is a concern, especially in the fields of sociology and technology, due to the importance of maintaining knowledge whilst building knowledge on innovations or changes within the respective experts’ industry. Therefore, the key factors for the selection process of experts for this thesis are knowledge, experience, and skills in the domain of interest, as well as state-of-the-art knowledge on the subject of this thesis.

A semi-structured interview approach is selected by the researcher. Therefore, a structure is purposely chosen to guide the directions of the interview without interfering with or altering the interviewee’s responses. During the preparation phase, the researcher creates a structure based on the literature review. To enhance the environmental comfort of the respondents, they are free to choose between any mode of conversation. However, due to the global outbreak of COVID-19, interviews via Microsoft Teams and phone calls are recommended by the researcher. The purpose of this study, as well as insights gained from it, became even more relevant, as a result of the pandemic.

To enhance responses, the experts are given two incentives – firstly, a high level of respect and recognition, as they are approached as experts in their respective fields, secondly, they will receive a summary of this thesis’ findings, which are expected to provide interesting insights to them. To avoid any form of ethical issues, data collected throughout the interviews are carefully handled by the researcher. Interviewees are anonymized throughout the discussion of the interviews’ results and are only named in the appendix if agreed upon before the interview. The high level of trust enabled through these steps are expected to enable the provision of deep insights into the interviewees’ respective personal and company experience. The interviews are structured in a way that minimizes threats to validity and reliability and makes results more easily replicable in the context of other countries. If agreed to by the interviewee, interviews are voice recorded and notes of the most important thoughts captured during the interview are taken. Bullet point transcripts are used for the data analysis phase. For the interviews, a bi-lingual approach is chosen. Therefore, some of the interviews are held in German, whilst most of them are held in English. However, the analysis and discussion of the results are in English.

The goal of the expert interviews is to get a better understanding of the topic of research by combining and comparing the different stakeholder perspectives. This is in line with the purpose of this thesis, which aims at understanding the awareness levels and different perceptions of, as

well as the possible need for a medication delivery platform in Austria, from the perspective of each of the stakeholder groups, respectively.

Interview Analysis

Data collected from the interviews are expected to be qualitative. Subsequently, data gathered is analyzed inductively. All of the respondents' statements are therefore coded based on overlaps in the discussed topics. The coding will be set up as follows:

- Potential Benefits
- Potential Drawbacks
- Potential Hindrances
- Engineering & Logistics of Platform
- COVID-19 & the Future of Digital Health

Sampling Method

The sampling method used is the purposive sampling method of 'expert sampling'. This sampling practice is particularly useful in the context of this research, as it is most commonly used when new areas of research are investigated (Etikan et al., 2016). One of the main drawbacks to this method is that the selection process of experts is prone to be rather subjective. However, the researcher aims to tackle this issue by defining experts, as stated above. Additionally, the researcher aims at maximizing the different inputs, in terms of ideas and perception, by interviewing representatives from each of the respective stakeholder groups.

Target Population

The qualitative part of this research targets five populations – namely experts representing doctors, pharmacies, the pharma industry, as well as digital health innovators, and social insurances. The geographical restriction relates to the scope of the research. Therefore, the experts should preferably be located in Austria. However, one exception was made to this preference, as one of the experts is located in the United Kingdom. This was due to the experts' knowledge of digital health innovation, as well as the fact that the expert frequently commutes between the UK and Austria. Additionally, experts are required to be available at least once through January and February 2021, to fit the time frame of the research.

Finally, each of the experts has to fulfill the following criteria:

Element:	Expert, as defined above, representing one of the relevant stakeholder groups

Extent:	Austria, United Kingdom
Time:	January-February 2021
Sampling Unit:	Expert, who has relevant background knowledge regarding the topic of research.

TABLE 2: TARGET POPULATION

Sample Size

The researcher conducts a total of six expert interviews, which is expected to provide sufficient information on the different perspectives and perceptions to form knowledgeable recommendations regarding the respective needs and objectives of each of the stakeholders, regarding a medication delivery platform. By carefully selecting each of the interviewees, the sum of insights gathered from all of the interviews is expected to provide a complete picture, regarding the stakeholder perceptions regarding the topic. Therefore, further interviews are not expected to add any additional information. Interviews usually take around 30-45 minutes.

3.3 Data analysis

The consumer survey conducted for this thesis consists of closed single-answer questions, response scales, and one open-ended question. The data collected is analyzed to discover significant results related to the different stakeholder perceptions regarding the introduction of a medication delivery platform in Austria.
The expert interview questionnaire is comprised of open-ended questions only. To gain a deeper understanding of the differences in stakeholder perception, the interview transcripts are analyzed and structured in a way that allowed the researcher to identify patterns, as well as overlapping opinions and ideas concealed in the topics of discussion. Answers from the interviews are transcribed and imported to Excel in bullet points. Subsequently, ideas and opinions are color-coded. To compare the different stakeholder perceptions, clusters of topics are created accordingly. All of the information gained from the expert interviews is presented objectively, without intervention by the researcher.

4 RESULTS

In this chapter, results obtained from the consumer survey, as well as the expert interviews are presented and discussed. This chapter aims to provide deeper insights into the quantitative data analysis of the consumer survey, as well as the qualitative data analysis of the expert interviews. Thus, correlations are established to validate the survey-based hypotheses. Additionally, the experts' answers are used to display the different stakeholder perceptions containing new ideas, as well as concepts previously discussed in the literature review of this research.

4.1 Descriptive Statistics

To provide an overview of the data used for this research, this subchapter presents the respondents' demographics, as well as their social statuses. To display the data, frequency tables exported from Google Forms are used.

4.1.1 Demographics & Social Status

Questions 1 through 5 cover the demographics and social status of the respondents. Initially, the respondents are asked to indicate their age (See Figure 3). Eight answer options are provided, ranging from 15-20 years to 80+ years. Most of the respondents (53.6%; n=52) are between 41-60 years old. The highest share of respondents can be found in the age segment of 51 to 60 years (34%; n=33). The second most common answer to question 1 is "41-50" (19.6%; n=19). The age segment ranging from 61 to 70 years accumulates the third most answers (12.4%, n=12). Respondents in the age range of 21 to 30 years make up 10.3% (n=10) and respondents from 31 to 40 make up another 9.3% (n=9). Respondents within the age segment of 71 to 80 years accumulate 8.2% (n=8), and 5.2% (n=5) of the respondents are at least 80 years of age. Lastly, one respondent (1.1%; n=1) falls into the age group of 15 to 20 years.

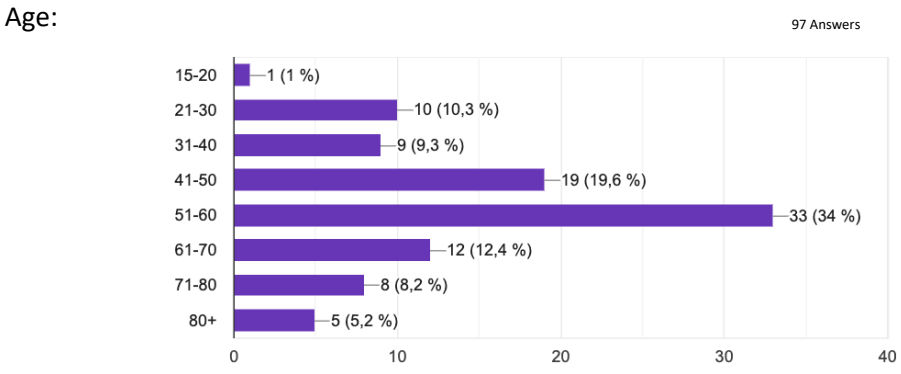

FIGURE 4: CONSUMER SURVEY QUESTION 1

Question 2 asks the respondents to indicate their gender. Four answer options are provided, including “Male”, “Female”, “Other”, and “Prefer not to say”. As displayed in Figure 4, 62.9% (n=61) of respondents identify as females, whereas 37.1% (n=36) of respondents identify as males.

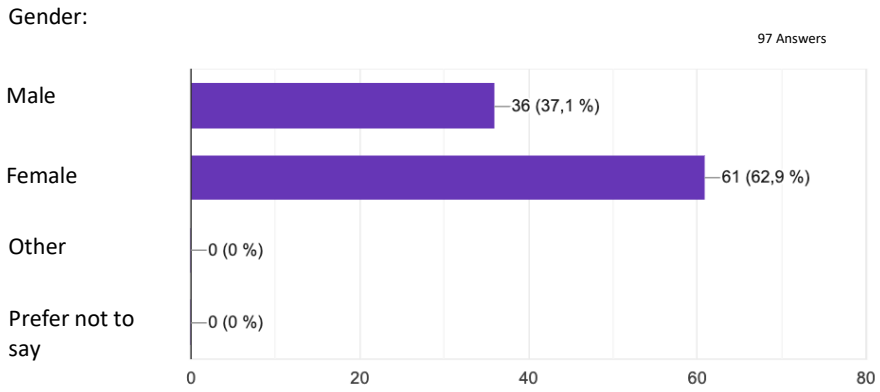

FIGURE 5: CONSUMER SURVEY QUESTION 2

Respondents are asked to specify their highest educational attainment in question 3 of the consumer survey. Six answer options are provided, consisting of “No compulsory education”, “Compulsory education”, “Apprenticeship”, “Vocational school”, “High school”, and “University/college”. Most respondents indicate that they have graduated high school (32%; n=31). The second-highest share of respondents selects “apprenticeship” as their highest educational attainment (28.9%; n=28). 20.6% (n=20) of respondents finished vocational school and 19.6% (n=19) graduated from university. Lastly, 9 respondents attained compulsory education and there are no respondents that did finish compulsory education.

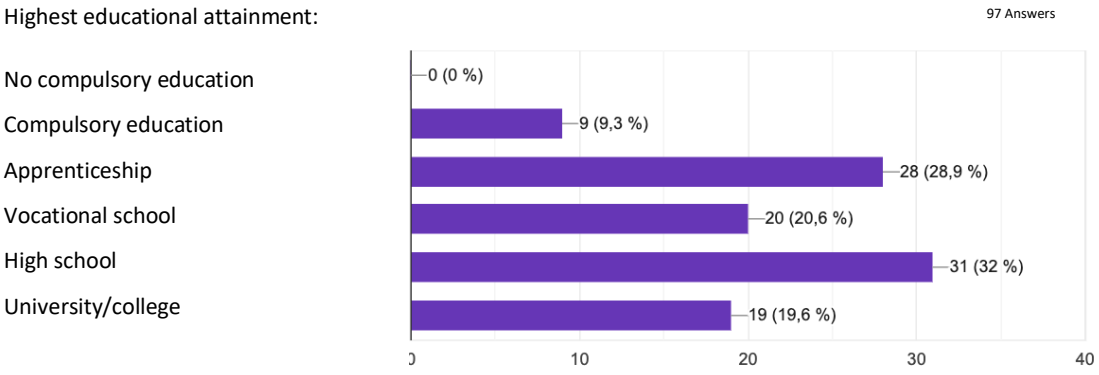

FIGURE 6: CONSUMER SURVEY QUESTION 3

Question 4 of the questionnaire asks the respondents to indicate their current employment status. Four possible answers are provided, including “Employed”, “Student/in training”, “Unemployed”, and “Retired”. As displayed in figure 6 below, the majority aof respondents (62.5%; n=60) are employed, at the time of taking part in the survey. The second-highest share of

respondents (28.1%; n=27) selects “Retired” as their current employment status. 5.2% (n=5) of respondents indicating that they are unemployed, and 4.2% (n=4) of respondents selecting “Student/in training” as their current employment status.

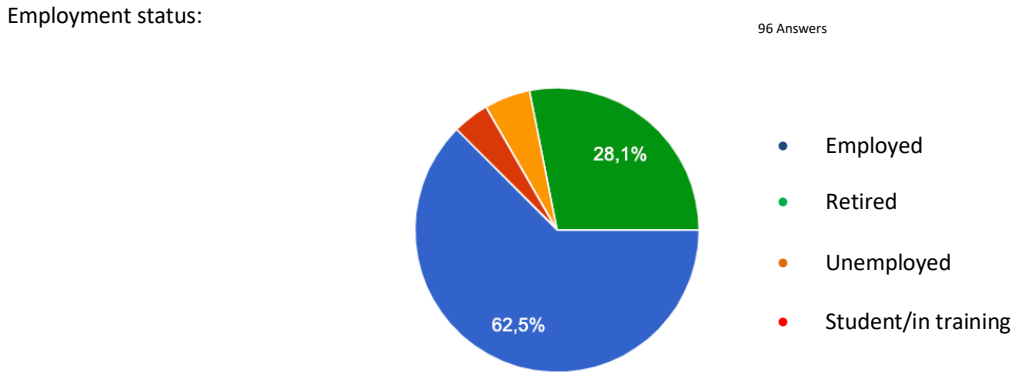

FIGURE 7: CONSUMER SURVEY QUESTION 4

The last question related to social status asks respondents to roughly indicate their monthly disposable income. Seven possible answers are provided, ranging from € 0 - € 1.000 to € 5.000 +, and including a “prefer not to say” answer option. From Figure 7 below, we can see that the majority of respondents has a monthly disposable income ranging from € 1.100 to € 3.000 (58.7%; n= 57). The highest share of respondents (30.9%; n=30) falls into the income bracket ranging from € 2.100 - € 3.000. 27.8% (n=27) of respondents has a monthly disposable income ranging from € 1.100 to € 2.000, and 16.5% (n=16) earn between € 3.100 and € 4.000 per month. 10.3% of respondents (n=10) are part of the income bracket ranging from € 0 to € 1.000, and 7.2% (n=7) choose not to declare their monthly income. Lastly, 4.1% of respondents (n=4) indicate earning between € 4.100 and € 5.000 per month, with the same number of respondents (n=4) stating to generate monthly disposable income over of € 5.000.

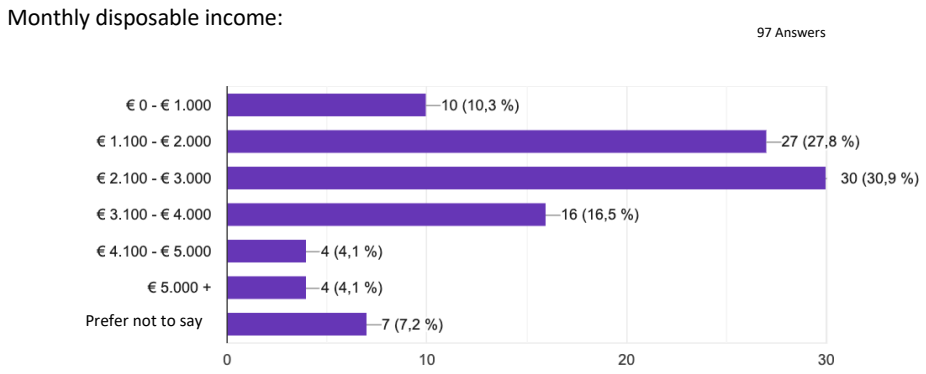

FIGURE 8: CONSUMER SURVEY QUESTION 5

4.2 Factor Analysis

Carrying out a factor analysis is one of the initial steps of the quantitative data analysis process of this thesis. According to Kim et al. (1978), factor analyses are based on the “Common Factor

Model" which states that "each observed response is influenced partially by underlying common factors and partially by underlying unique factors". Subsequently, factor analyses inspect the patterns of correlation between the observed variables (Kim et al., 1978). Finally, variables that are highly correlated are likely influenced by the same factors, while relatively uncorrelated variables are likely influenced by different factors. Therefore, multiple variables found in the research can be combined to form "factors".

The factor analysis for this research is carried out in PSPP. Results from the scree plot (figure 8), as well as the rotated component matrix (figure 9), imply that between 2 and 4 major factors can be identified. Each of the factors consists of variables with a factor above 0.4. Factor 1 consists of the variables 21 to 25 (questions 20-24 in the consumer survey), which are all platform-related questions. This can be seen in component 1 of the rotated component matrix. Factor 2 comprises the variables 9 to 11 (questions 8-10 in the consumer survey), which are all related to medication consumption. This can be seen in the second column - representing component 2 - of the rotated component matrix. Factor 3 contains the variables 7, 20, and 26 (questions 6, 19, and 25 from the consumer survey), which relate to smartphone use and data privacy concerns. This can be seen in the third column of the rotated component matrix. Lastly, Factor 4 consists of the variables 19 and 25 (questions 18 and 24 in the consumer survey), which relate to general interest and usefulness. This can be seen in the fourth column – representing component 4 - of the rotated component matrix. This factor is eliminated by the researcher, as it includes the dependent variable used in the hypotheses testing process. Sum scores are calculated accordingly by the researcher.

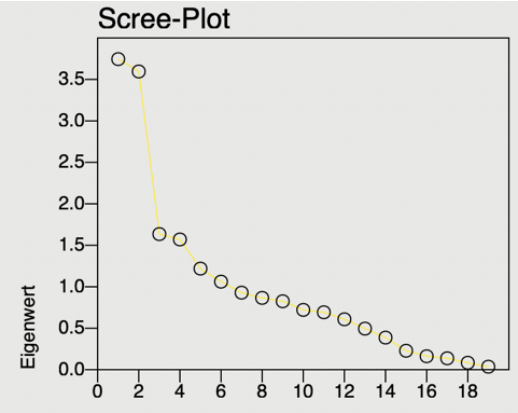

Figure 9: Scree Plot Factor Analysis

	Komponente					
	1	2	3	4	5	6
VAR007	-.05	.08	.53	-.06	-.23	.52
VAR008	.08	-.08	.06	-.20	-.71	.20
VAR009	.07	.93	-.04	-.03	.11	.19
VAR010	.04	.90	-.02	-.04	.12	.17
VAR011	.07	.90	-.05	-.10	.18	.21
VAR012	.12	.19	-.23	-.61	-.08	-.06
VAR013	.04	-.27	-.07	-.62	.22	.04
VAR014	-.06	.59	-.07	-.05	-.09	-.28
VAR016	-.01	.30	.14	-.05	.65	.37
VAR017	-.36	.08	.15	-.19	.07	-.46
VAR018	-.04	.27	-.06	.00	.09	.68
VAR019	.37	-.22	-.06	.73	.16	-.04
Var20umkodiert	.14	-.15	.80	.04	.30	-.05
VAR021	.72	.13	-.07	.04	-.02	.03
VAR022	.91	.03	.10	.07	.02	-.08
VAR023	.90	.02	.07	.04	-.09	.06
VAR024	.57	-.16	-.10	.49	.15	.15
VAR025	.44	-.05	-.12	.72	.18	.07
Var26umkodiert	-.13	-.06	.65	.15	-.45	-.16

FIGURE 10: ROTATED COMPONENT MATRIX FACTOR ANALYSIS

4.3 Validation of Survey-based Hypotheses

All of the 8 survey-based hypotheses are concerned with consumer perception of a medication delivery system in Austria. The hypothesis development process has already been described in great detail in subchapter 3.2.1.1. This subchapter will focus on the validity of said hypotheses.

4.3.1 Hypothesis 1: There is a correlation between performance expectancy and consumer perception of a medication delivery platform.

The validation of hypothesis 1 is concerned with detecting a correlation between the variables "perceived usefulness" (VAR025) and "general interest in using a medication delivery platform" (VAR019). As displayed in table 3 below, the two variables are significantly correlated (r=0.82; p<0.01). Therefore, the null hypothesis (H_0) is rejected, and H_1 was accepted. Considering the relatively high r-value, the correlation can be described as rather strong and positive.

		VAR019	VAR025
VAR019	Pearson Korrelation	1.00	.82
	Sig. (2-seitig)		.000
	N	97	96
VAR025	Pearson Korrelation	.82	1.00
	Sig. (2-seitig)	.000	
	N	96	96

TABLE 3: CORRELATION BETWEEN VARIABLE 19 AND VARIABLE 25

4.3.2 Hypothesis 2: There is a correlation between effort expectancy and consumer perception of a medication delivery platform.

The second hypothesis attends to the possible correlation between the variables "effort expectancy" (VAR022) and "general interest in using a medication delivery platform" (VAR019). From table 4, we can extract a moderately positive, significant correlation (r=0.4; p<0.01) between the two variables. Therefore, H_0 is rejected, and H_1 was accepted.

		VAR019	VAR022
VAR019	Pearson Korrelation	1.00	.40
	Sig. (2-seitig)		.000
	N	97	96
VAR022	Pearson Korrelation	.40	1.00
	Sig. (2-seitig)	.000	
	N	96	96

TABLE 4: CORRELATION BETWEEN VARIABLE 19 AND VARIABLE 22

4.3.3 Hypothesis 3: There is a correlation between consumer trust and consumer perception of a medication delivery platform.

The third hypothesis considers a correlation between the variables “consumer trust” (Var20umkodiert), “authenticity” (VAR021), and “general interest in using a medication delivery platform” (VAR019). From tables 5 and 6 below, we can see that both of the variables tested are significantly correlated to the dependent variable (p<=0.05). Additionally, the r-values of 0.2 and 0.26 respectively imply a rather weak correlation. Therefore, H_0 is rejected, and H_1 is accepted.

		VAR019	Var20umkodiert
VAR019	Pearson Korrelation	1.00	.20
	Sig. (2-seitig)		.048
	N	97	97
Var20umkodiert	Pearson Korrelation	.20	1.00
	Sig. (2-seitig)	.048	
	N	97	97

TABLE 5: CORRELATION BTEWEEN VARIABLE 19 AND VARIABLE 20 (RECODED)

		VAR019	VAR021
VAR019	Pearson Korrelation	1.00	.26
	Sig. (2-seitig)		.010
	N	97	96
VAR021	Pearson Korrelation	.26	1.00
	Sig. (2-seitig)	.010	
	N	96	96

TABLE 6: CORRELATION BETWEEN VARIABLE 19 AND VARIABLE 21

4.3.4 Hypothesis 4: There is a correlation between perceived cost of usage and consumer perception of a medication delivery platform.

Hypothesis four investigates the correlation between the variables “cost aspect” (VAR023) and “general interest in using a medication delivery platform” (VAR019). Table 7 depicts a rather weak, significant correlation between the two variables (r=0.27; p<=0.05). Therefore, H_0 is rejected and H_1 is accepted.

		VAR019	VAR023
VAR019	Pearson Korrelation	1.00	.27
	Sig. (2-seitig)		.008
	N	97	96
VAR023	Pearson Korrelation	.27	1.00
	Sig. (2-seitig)	.008	
	N	96	96

TABLE 7: CORRELATION BETWEEN VARIABLE 19 AND VARIABLE 23

4.3.5 Hypothesis 5: There is a correlation between perceived time savings and consumer perception of a medication delivery platform.

The fifth hypothesis considers a correlation between the variables "time savings" (VAR024) and "general interest in using a medication delivery platform" (VAR019). In table 8, we can see that a moderately positive, significant correlation is detected (r=0.52; p<0.01). Therefore, H0 is rejected, and H1 is accepted.

		VAR019	*VAR024*
VAR019	*Pearson Korrelation*	1.00	.52
	Sig. (2-seitig)		.000
	N	97	95
VAR024	*Pearson Korrelation*	.52	1.00
	Sig. (2-seitig)	.000	
	N	95	95

TABLE 8: CORRELATION BETWEEN VARIABLE 19 AND VARIABLE 24

4.3.6 Hypothesis 6: There is a correlation between digital literacy and consumer perception of a medication delivery platform.

Hypothesis 6 is concerned with detecting a correlation between the variables "smartphone use" (VAR007), "laptop use" (VAR008), "use without digital devices" (VAR026), and "general interest in using a medication delivery platform" (VAR019). Therefore, three independent variables are correlated to the same dependent variable. From tables 9 to 11, we can extract that none of the correlations found are significant (p>0.05). Further proof for the non-significant nature of the relationship can be found in table 12, which correlates the sum score of the variables influenced by factor 3 of the factor analysis with the dependent variable. Therefore, H0 is accepted, and H1 is rejected.

		VAR019	*VAR007*
VAR019	*Pearson Korrelation*	1.00	-.12
	Sig. (2-seitig)		.261
	N	97	96
VAR007	*Pearson Korrelation*	-.12	1.00
	Sig. (2-seitig)	.261	
	N	96	96

Table 9: Correlation Between Variable 19 and Variable 7

		VAR019	*VAR008*
VAR019	*Pearson Korrelation*	1.00	-.07
	Sig. (2-seitig)		.495
	N	97	86
VAR008	*Pearson Korrelation*	-.07	1.00
	Sig. (2-seitig)	.495	
	N	86	86

Table 10: Correlation Between Variable 19 and Variable 8

		VAR019	Var26umkodiert
VAR019	Pearson Korrelation	1.00	.03
	Sig. (2-seitig)		.808
	N	97	96
Var26umkodiert	Pearson Korrelation	.03	1.00
	Sig. (2-seitig)	.808	
	N	96	96

TABLE 11: CORRELATION BETWEEN VARIABLE 19 AND VARIABLE 26 (RECODED)

		VAR019	SumFactor3
VAR019	Pearson Korrelation	1.00	-.12
	Sig. (2-seitig)		.265
	N	97	95
SumFactor3	Pearson Korrelation	-.12	1.00
	Sig. (2-seitig)	.265	
	N	95	95

TABLE 12: CORRELATION BETWEEN VARIABLE 19 AND SUM SCORE FACTOR 3

4.3.7 Hypothesis 7: There is a correlation between medication consumption and consumer perception of a medication delivery platform.

The seventh hypothesis investigates the correlation between the variables “regular medication consumption” (VAR009), “prescription medicine consumption” (VAR010), “regularity of consumption of medicine” (VAR011), and “general interest in a medication delivery platform” (VAR019). Therefore, three independent variables are correlated to the same dependent variable (tables 13-15). Additionally, the three independent variables used for validating this hypothesis are found to be influenced by underlying common factors in the factor analysis mentioned in subchapter 4.2 of this research. Therefore, their sum score is also correlated to the dependent variable (Table 16). From the tables below, one can extract that all of the independent variables are weakly negative (r=-0.22; -0.2; -0.23) significantly correlated to the dependent variable ($p<0.05$). Unsurprisingly, the correlation between the sum score formed from factor 2 and the dependent variable (Table 16) shows a similar outcome (r=-0.22; $p<0.05$). Therefore, H0 is rejected, and H1 is accepted.

		VAR019	VAR009
VAR019	Pearson Korrelation	1.00	-.22
	Sig. (2-seitig)		.029
	N	97	97
VAR009	Pearson Korrelation	-.22	1.00
	Sig. (2-seitig)	.029	
	N	97	97

Table 13: Correlation Between Variable 19 and Variable 9

		VAR019	VAR010
VAR019	Pearson Korrelation	1.00	-.20
	Sig. (2-seitig)		.048
	N	97	96
VAR010	Pearson Korrelation	-.20	1.00
	Sig. (2-seitig)	.048	
	N	96	96

Table 14: Correlation Between Variable 19 and Variable 10

		VAR019	VAR011
VAR019	Pearson Korrelation	1.00	-.23
	Sig. (2-seitig)		.023
	N	97	97
VAR011	Pearson Korrelation	-.23	1.00
	Sig. (2-seitig)	.023	
	N	97	97

TABLE 15: CORRELATION BETWEEN VARIABLE 19 AND VARIABLE 11

		VAR019	SumFactor2
VAR019	Pearson Korrelation	1.00	-.22
	Sig. (2-seitig)		.031
	N	97	96
SumFactor2	Pearson Korrelation	-.22	1.00
	Sig. (2-seitig)	.031	
	N	96	96

TABLE 16: CORRELATION BETWEEN VARIABLE 19 AND SUM SCORE OF FACTOR 2

4.3.8 Hypothesis 8: There is a correlation between consumer mobility and consumer perception of a medication delivery platform.

The eighth and last hypothesis considers a correlation between the variables “mobility” (VAR013), “others pick up medicine for me” (VAR018), and “general interest in using a medication delivery platform” (VAR019). Therefore, to validate this hypothesis, two independent variables are correlated with the same dependent variable. From tables 17 and 18 we can see that no significant correlations are detected (p>0.05). Therefore, H0 is accepted, and H1 is rejected.

		VAR019	VAR013
VAR019	Pearson Korrelation	1.00	-.17
	Sig. (2-seitig)		.109
	N	97	95
VAR013	Pearson Korrelation	-.17	1.00
	Sig. (2-seitig)	.109	
	N	95	95

TABLE 17: CORRELATION BETWEEN VARIABLE 19 AND VARIABLE 13

		VAR019	VAR018
VAR019	Pearson Korrelation	1.00	-.03
	Sig. (2-seitig)		.752
	N	97	97
VAR018	Pearson Korrelation	-.03	1.00
	Sig. (2-seitig)	.752	
	N	97	97

TABLE 18: CORRELATION BETWEEN VARIABLE 19 AND VARIABLE 18

4.4 Expert Interview Findings

This chapter identifies common topics and concepts, as well as differences in stakeholder perception gathered from the expert interviews.

4.4.1 Thematic Cluster Analysis

By way of cluster analysis, the information gained from the previously conducted expert interviews is structured and presented in this chapter. Transcripts from the interviews are used as the basis of this chapter. Deploying a cluster analysis allows for objective presentation of patterns and overlaps found in the information gathered from the interviews. Therefore, clusters categorize overlapping insights found in the transcripts of the expert interviews (Table 19).

Number	Cluster
1	Potential Benefits
2	Potential Drawbacks
3	Potential Hindrances
4	Engineering & Logistics of Platform
5	COVID-19 & the Future of Digital Health

TABLE 19: THEMATIC CLUSTER ANALYSIS

Potential Benefits

The experts mention a wide variety of potential benefits enabled by the introduction of a medication delivery platform in Austria. Firstly, the experts mention the increased accessibility of medicine to the patients. Secondly, increased levels of efficiency in terms of treatment and time are identified as benefits. This time aspect is not only relevant to the consumers, but also doctors, pharmacies, and the healthcare system in general. According to the experts, achieving better alignment of the stakeholders allows for increased productivity, effective stakeholder communication, and more efficient use of doctors' resources. Additionally, such a platform is identified as especially relevant to immobile patients, risk groups of COVID-19, and patients undergoing long-term treatment, by the experts. Automating the delivery of repeat prescriptions could provide value to consumers, as well as pharmacies. Thus, consumers could receive their refills on time, and pharmacies would benefit from earning a fixed income. Moreover, the experts mention increased accuracy of prescriptions as a potential benefit. Lastly, the potential inclusion of patients in the treatment process empowered by a feedback loop and personalized treatment is mentioned as a benefit by the experts. As part of this feedback loop, the potential harm caused by the simultaneous use of multiple medicines could be indicated.

Potential Drawbacks

Meeting high stakeholder standards and complying with the complex regulations of the healthcare system could lead to exorbitant running costs. Additionally, the experts find liability

concerns to be a significant drawback to the platform. Thus, the risk of future lawsuits, as well as the risk of human error, remains relatively high. The experts disclose data related to healthcare as very sensitive. Therefore, the experts emphasize that all of the collected data has to be handled very carefully. Moreover, the experts identify the social risk of further isolating the elderly, as well as people with limited mobility from society.

Potential Hindrances

In terms of potential barriers, the experts commonly mention the complex healthcare framework, as well as legal - and regulatory constraints. Therefore, the barrier and cost of entry for providers of new solutions are stated to be relatively high. In general, the experts find healthcare-related innovation to be lagging behind other industries. Thus, stakeholder-related conflicts of interest are found to complicate innovation processes. Therefore, any stakeholder could block any innovation they perceive as a competitive threat. Furthermore, the experts state that for the stakeholders to fully support any innovation, it has to offer added value to them. Cross-nationally, varying healthcare systems are stated to limit the scalability of healthcare innovations. Additionally, the experts state considerable differences between developing and developed countries in terms of applying healthcare innovation. Finally, social insurances are found to be not yet prepared to widely cover the cost of digital solutions.

Engineering & Logistics of Platform

This subchapter presents findings related to the best possible way of setting up a medication delivery platform, as indicated by the experts. Firstly, the inclusion of the whole value chain of stakeholders is mentioned to be crucial to the success of such a concept. Therefore, a well-prepared communication strategy is emphasized to be essential to the platform's success. Additionally, the experts agree that the platform solution must be easy to use and offer a support system to the stakeholders in the early stages of adoption. The experts hence mention the ease of use as the order winner. Convincing social insurances of the added value for their clients by launching a pilot project is found to be crucial, as the cost factor could thereby be reduced or eliminated.

Furthermore, offering the possibility to order non-prescription medicine is found to accelerate growth early on. The inclusion of social interactions is another factor mentioned by the experts. Therefore, it was emphasized that personal patient consultation must remain intact. In terms of the logistics of such a platform, state-of-the-art supply chain management is found to be required. Thus, ensuring the correct consumer receives the right medicine within an appropriate time frame is of utmost importance to the experts. Logistics of medicine delivery are often secured by the use of Blockchain technology this is mentioned to be relevant to this concept as well by the experts.

COVID-19 & the Future of Digital Health

The experts mention the COVID-19 pandemic as a crisis that made the need to use digital health become more apparent than ever. High adoption - and usage rates of digital health innovation are driven by the inevitable switch to digital health consultation. The experts expect this positive trend to continue post-COVID. Additionally, digital health tools are expected to support governmental decision-making in the future. Finally, overcoming the issues in terms of scalability mentioned above is mentioned to be crucial to achieving mass adoption of digital health solutions.

5 DISCUSSION

This subchapter discusses the findings of the consumer survey and the expert interviews. Implications are drawn from the results and related to findings from the literature.

5.1 Consumer Survey

The consumer survey investigates consumer perceptions, needs, preferences, and expectations. Moreover, it attends to perceived usefulness, effort expectancy, and consumer trust. Additionally, the cost – and time aspect of the platform is investigated. Digital literacy, medication consumption, and mobility are also examined.

Regarding consumer perception of the platform, the consumer's interest in using the advocated concept is strongly related to its perceived usefulness. This finding implies that perceived usefulness is at the core of the consumer's decision to adopt – or not adopt – an innovation. According to Davis (1989), an innovation has to be perceived as at least somewhat useful by the consumer to gauge interest in adapting it – the consumer survey thus confirms this finding. Interestingly, almost half of the respondents perceive the platform to be rather useless to them (n=46). This finding underlines the importance of identifying the target groups of the concept before launching it. Additional research is needed to identify why a rather small number of respondents find this concept useful to them. Additionally, perceived ease of use – as part of the concept of expert expectancy is investigated. Thus, consumers are increasingly interested in an easy-to-use platform concept. The vast majority of respondents (n=81) states that ease of use is very important to them. This finding is supported by Davis (1989) and Venkatesh et al. (2003), who argue that perceived ease of use encourages consumers to use innovations. The concept is thus especially relevant in the stages of early adoption.

The majority of respondents (n=79) states that the authenticity of the platform is crucial to them. This finding implies that it is of utmost importance to the consumers that such a platform meets governmental regulations and operates lawfully. Ensuring high levels of data security, as well as a state-of-the-art supply chain, can thus be expected to be crucial to the success of a medication delivery platform. Additionally, involving all stakeholders of the healthcare sector, as well as the responsible government bodies, in the development process can further increase perceived authenticity. Interestingly, the majority of respondents (n=61) express little to no concerns in terms of data security when using the platform. This contradicts findings from Montoya & Jano (2007) and Georgiev & Shtereva-Tzouni (2020) related to online pharmacies. This finding can partly be explained by the relatively high digital literacy of Austrians (Szijártó, 2020). Another possible explanation can be found in the difference between online pharmacies and the platform concept discussed in this research. Thus, Montoya & Jano (2007) mention invalid, illegally operating online pharmacies, as well as missed precautions regarding the storage and delivery

of medicine as factors negatively related to consumer trust. However, the stakeholder collaboration needed to create such a platform facilitates the ethical and careful handling of consumer data. Nevertheless, besides the low data and privacy concerns expressed by the consumers, ensuring data security must be prioritized when launching a platform for the delivery of medicine.

Most of the respondents (n=56) find low costs to be crucial to them. Additionally, over a quarter of respondents (n=27) states low cost to be somewhat important to them. Subsequently, a weak uphill correlation between cost and general interest in using a medication delivery platform is found. This finding is supported by Herzlinger (2014), who states that low costs are an integral part of consumer needs. The platform concept discussed throughout this research offers one crucial benefit in terms of cost-effective operation, it has no variable costs once it is launched. It can thus operate at zero marginal cost (Trabucchi & Buganza 2019). Therefore, the expected cost of delivery is comparatively low, which, in turn, is expected to increase consumer willingness to adopt the innovation.

Additionally, the majority of respondents indicate that time savings enabled by using the platform are crucial to them (n=60). Thus, a moderately positive correlation between time savings and the general interest to use a medication delivery platform is found. This finding is in line with the previously discussed argument concerning the impact of time savings on consumer willingness to use online delivery services. According to the authors, the time savings aspect is especially relevant to consumers from higher income brackets which represent a significant part of the target group for a medication delivery platform (Yeo et al., 2017). Interestingly, the majority of respondents (n=52) states it takes them longer than five minutes to get to the closest pharmacy by foot. This finding seems to prove the time savings aspect to be particularly relevant to people consuming medicine regularly. The correlation between regularity of medication consumption and interest in using a medication delivery platform is discussed below.

Regarding the impact of digital literacy on the general interest in using a medication delivery platform, no significant correlations are found. Most of the respondents indicate that they use their smartphones daily (n=95). Moreover, the majority of respondents (n=56) indicate using their laptops every day. Only around a quarter of respondents (n=28) imply that they would prefer to not need digital devices when using the platform. Overall, these findings are consistent with those discussed by Szijártó (2020). Austrians are comparatively highly digitally literate (Szijártó, 2020). Furthermore, the author states that a positive correlation between digital literacy and willingness to adopt digital health innovation is to be expected. This is however not confirmed by the findings of this study. A reason for this finding could be the fact that daily smartphone - and laptop use are so common within the sample of this research that they did not impact any other variables but rather acted as a given. Moreover, simply using a digital device does not directly imply digital literacy. Thus, a person could use a smartphone to take - and receive calls, and yet not know how to use other functions. Overall, societal digital literacy is

expected to continue to rise as digital natives come of age. Subsequently, interest in digital health innovations is expected to experience a long-term rise (Safai & Kalis, 2020).

In terms of medication consumption, most respondents indicate regularly consuming medicine (n=51). Moreover, the same amount of respondents (n=51) state to be consuming prescription medicine at the moment. Just above half of the respondents (n=49) specify that they consume medication daily, whereas 46 respondents suggest that they consume medication rarely (n=38) or never (n=8). The contextual framework suggests a correlation between medication consumption and the general interest in using a medication delivery platform. The subsequent hypothesis is validated by the results of the correlation tests. However, the direction of the correlation shows that the correlation is mildly negative, meaning that respondents that consume medicine regularly are less inclined to use such a platform than respondents consuming medicine rather irregularly. No previous literature on this topic is reviewed, however, one potential explanation for this finding is that respondents who regularly consume medication are so accustomed to going to the pharmacy to pick up their medication that their interest in a medication platform is thus rather low.

The last finding of the consumer survey is that consumer mobility is not significantly related to the general interest in using a medication delivery platform. Regarding the sample of this research, this finding does not come as a surprise. Almost all of the respondents (n=91) indicate to be mobile enough to pick up their medicine from the pharmacy on their own. Moreover, only around a fifth of respondents (n=16) states that people from their immediate surroundings regularly pick up medicine for them. The benefits of medicine delivery services to people with limited mobility mentioned by Montoya & Jano (2007) therefore seem rather irrelevant to the sample of this research.

5.2 Expert Interviews

Ahead of discussing the findings, the roles of the experts in the healthcare system are discussed. Thus, expert 1 has a biology background and started working in the pharmaceutical industry in 2004. Nowadays, expert 1 is working as a medical advisor and medical lead for vaccines at a big pharmaceutical company. Expert 2 worked in pharmacies in Vienna for ten years before opening his pharmacy in 1992 and retiring in the early 2010s. Expert 3 started working in healthcare in 1997 and is the founder of a successful telemedicine-related start-up. Expert 4 has a molecular biology and business background and is the CEO of a high-tech incubator in Vienna. Expert 5 studied pharmacy in Germany and worked in pharmacies for four years before completing his Ph.D. studies in Vienna. Since 2015, expert 5 has been working at the “Österreichische Gebietskrankenkasse” in the department of medical treatment economy. As part of his profession, expert 5 aims at treating patients more efficiently. Expert 6 is a general practitioner, occupational physician, and school doctor.

The findings from the expert interviews are mostly overlapping with slight differences in perception concerning the stakeholders' main interests. One of the most notable differences is the experts' level of involvement with digital health innovations. Firstly, expert 1 has some experience with digital healthcare tools. However, they were largely data-analysis-related. Secondly, experts 2, 5, and 6 have no experience with digital healthcare innovations. Lastly, experts 3 and 4 are deeply involved with digital healthcare innovations.

Generally, all of the experts agree that the healthcare framework is rather complex. Legal frameworks, as well as regulatory constraints, are mentioned as potential hindrances of innovation. Additionally, Expert 4 states that market adoption tends to be comparatively slow, as the consumer is hesitant to take risks related to health. Thus, convincing the user of an innovation's benefits can be rather troublesome. Expert 3 states that healthcare regulations differ nationally. This argument is expanded upon by expert 4, who mentions differences within countries on the state level. This finding is especially applicable to the DACH region – consisting of Germany, Austria, and Switzerland. Experts 3 and 4 agree that this divergence makes the up-scaling process of any healthcare-related innovation incredibly cumbersome. Furthermore, expert 4 states that conflicts of interest between the different stakeholders could hinder innovation. These findings are consistent with the literature discussed in subchapter 2.2.4 of this research.

Additional barriers discussed by the experts are the legal – and technological risk, as well as data privacy and – security concerns. Thus, experts 3 and 4 emphasize the importance of settling the uncertainty surrounding legal liability. Expert 1 stresses the importance of data security, which is backed up by experts 3, 4, and 5. Healthcare-related data is thereby recognized as highly sensitive data by expert 4. This is because it includes personal information, as well as data related to diseases, medication, and treatment. The importance of data security in healthcare innovation is also discussed by Safafi & Kalis (2020) and Singh et al. (2020). Finally, the risk of prescription medicine abuse, as mentioned by Montoya & Jano (2007), is pointed out by expert 1. Moreover, expert 4 affirms the social risk related to a medication delivery platform. It is thus important to prevent the social exclusion of people with limited mobility. Finally, as previously discussed by Herzlinger (2014), experts 4 and 5 state high costs due to the complexity of such a platform as a potential hindrance. Expert 4 specifically points out that only a very small part of Austria's population is prepared to pay for health innovation out of their pocket.

To overcome the barriers mentioned above, the experts suggest varying approaches. Expert 4 states the importance of including the whole value chain of stakeholders in the development process of the platform. Thus, keeping the parties' interests at the core of the platform will enhance stakeholder alignment and – support concerning the concept. This finding was previously discussed by Bhatti et al. (2018), who endorses the implementation of co-creation methods, to maximize stakeholder engagement. According to Experts 3 and 5, working against the grain is not advised, as any major stakeholder could block the innovation if it is perceived as a competitive threat. Working around the conflict of interest in the healthcare sector was previously

discussed by Herzlinger (2014). Additionally, the experts agree with Davis (1989) that the platform must be very easy to use for all of the stakeholders. Expert 6 suggests offering different layouts of the platform adapted to different consumer groups. Thus, the elderly, as well as people with low digital literacy, are expected to need a simplified version of the platform. The importance of offering a consumer-centered design was previously stated by Bhatti et al. (2018) and Herzlinger (2014). Expert 2 suggests a support system for consumers during the stages of early adoption. Expert 5 states conceptualizing the platform and subsequently launching it by way of a pilot project, to identify additional stakeholder needs. To overcome the cost-aspect, Expert 4 mentions the importance of social insurances. Thus, the support of social insurers would eliminate the cost factor. However, according to expert 4, Austria's social insurances are not yet prepared to pay for digital healthcare solutions. This would need to change, to drive mass adoption of digital health innovation.

According to experts 1 and 5, the logistics of medicine delivery have to be considered before launching a medication delivery platform. Thus, a state-of-the-art supply chain is necessary to ensure the safe and timely delivery of the medication. Experts 2, 3, and 4 confirmed this statement with expert 4 stating that blockchain technology could serve as the basis of a safe platform structure. The logistics of supplying the correct medicine, at a good quality was also found to be essential to consumers by Renberg et al. (2011).

Regarding the benefits of a medication delivery platform, the experts agree that the platform offers added value to the consumer. Thus, experts 1 and 3 points out the increased accessibility of medicine. This is found to be especially valuable to people with limited mobility by expert 3. The positive impact of digital health innovations on the accessibility of medicine was previously stated by Georgiev & Shtereva-Tzouni (2020) and Renberg et al. (2020). Additionally, the experts point out consumers undergoing long-term treatments, as well as risk groups of COVID-19, as beneficiaries of a medicine delivery platform. Thus, expert 3 states the possibility of automating repeat prescriptions and subsequently delivering the refill to the consumer as a benefit to all of the parties involved. Expert 5 stresses the idea of creating a feedback loop to enable more effective patient care. Therefore, the consumer reports side effects, as well as benefits to the doctor through the platform. Subsequently, the medication, as well as the dosage of the medication, can be adapted whenever needed. Expert 4 states the benefit of increased patient enablement gained by using the platform. Moreover, the more efficient communication between consumers, doctors, and pharmacies is expected to allow for more personalized treatments. According to expert 1, the launch of such a platform creates a new market space that – in addition to consumers – also provides added value to pharmacies and doctors. Thus, time-efficiency benefits and more effective use of the doctor's resource management could help take some of the pressure off the healthcare system, according to expert 3. Expert 4 expands this finding onto all of the involved stakeholders and additionally states a fixed income arising from patients

consuming long-term medicine as a benefit to pharmacies. Szijártó (2020) previously stressed the potential efficiency benefits of digital health innovations to the healthcare system.

The COVID-19 pandemic currently affects lives globally. Thus, the following passage will attend to the experts' perception of the impact of COVID-19 on digital health innovation. Expert 4 suggests that the need to use digital health solutions became more apparent than ever before. Therefore, according to expert 3, a rapid increase in usage rates of digital health is observable, as consumers are driven towards adopting eHealth technology. This finding was previously stated by Safafi & Kalis (2020) and Szijártó (2020). Expert 1 mentions the noteworthy increase in adoption of telemedicine during the pandemic. However, according to expert 4, the technologies used rarely meet data privacy standards. Furthermore, expert 4 stresses that it became clear that the Austrian healthcare system is operating on the verge of financial stability during the pandemic. As mentioned above, digital health innovation can facilitate the more efficient use of healthcare resources (Szijártó, 2020). Thus, the experts expect the positive trend in digital health adoption to continue post-pandemic.

The last paragraph of this section provides the reader with the experts' perspectives regarding the future of digital health. As stated above, there is a consensus that the adoption rates of digital health will continue to rise in the future. Expert 1 states that decision-making – on a corporate – and governmental basis – is expected to be increasingly be supported by digital health technologies. Thus, big data-based predictions regarding the effectiveness of treatments are expected to become progressively more accurate. E-records form the basis for digital health solutions that could be linked to the social security system, according to experts 1 and 3. Expert 4 once again stresses the importance of supporting people to live healthy lifestyles. Thus, focusing on preventive rather than pro-active care serves as the basis for a more effective healthcare system. Experts 1 and 4 once more state telemedical care as an important pillar of the future of digital health. Therefore, elderly – and chronic care can mostly be handled remotely, which allows for more effective use of the doctors' time resources.

5.3 Synthesis

The following subchapter draws comparisons and reaches conclusions from the research findings of both – the quantitative and qualitative – modes of research. The mixed-methods approach of this thesis ensures comprehensive data collection. The research investigates stakeholder perceptions of a medication delivery platform in Austria, as well as potential effects and impacts on the different stakeholder groups.

Generally, stakeholder perception of the conceptualized platform is positive. Although some concerns remain, the experts agree that added value exists for all of the stakeholder groups. Most of them argue in support of such a platform, whilst some were rather indifferent about it. From the consumer perspective, a wide variety in interest in such a platform is found. Therefore,

just above half of the survey respondents (n=53) indicate being interested in using a medication delivery. This partly confirms the argument made by the experts that such a platform is especially relevant to a very small target group – namely that of people with limited mobility. Generally, the experts find the increased accessibility to being highly beneficial to the consumers – especially those that consume medicine regularly. This finding is confirmed by the analysis of the consumer survey, in which a correlation between regular medicine consumption and general interest in a medication platform is found.

In terms of the impact on the different stakeholder groups, the experts state some concerns in terms of an unjust distribution of revenue related to the pharmacy's location. Therefore, centrally located pharmacies benefit from such a platform, while more remote pharmacies suffer. This finding is based on the assumption that centrally located pharmacies can reach a larger population of consumers. Thus, their revenues are expected to increase by a significantly larger percentage, in comparison to remote pharmacies. Repeat prescriptions are mentioned as a source of fixed income to the pharmacies enabled by the platform. Additionally, doctors, pharmacists, and consumers have to adopt this new technology. Therefore, the experts mention a support system as imminent to facilitate the early stages of adoption. Including the stakeholders in the development of the platform can thus help adapt its core functions and layout to their needs.

Data security concerns are repeatedly mentioned by the experts. However, the majority of consumers (n=61) indicate little worries in terms of data security and – privacy. Anyhow, state-of-the-art data security measures are necessary to gain the support of all of the stakeholders. Therefore, the experts stress healthcare-related data to be highly sensitive.

The experts find the cost factor to be a determinant of the consumers' willingness to adopt such a platform. This finding is confirmed by the consumer survey, where the large majority of consumers (n=83) indicate that the cost aspect is important to them. The experts hereby mention social insurances as the key to more digital health innovation. Thus, social insurances are not prepared to pay for digital solutions yet, however, they theoretically have the power to eliminate the cost factor for the consumer. Therefore, the coverage of digital health solutions by social insurances can significantly drive consumer adoption rates.

Finally, time efficiency is found to be a major benefit of the platform by the experts. Therefore, better alignment and communication between the stakeholders enables increased efficiency. The time-savings-aspect is also found to be crucial to the consumers. Thus, a significant correlation between time savings and the general interest in a medication delivery platform can be found in the analysis of the consumer survey.

5.3.1 Findings Related to Stakeholder Perception

This subchapter generalizes the findings for each of the stakeholder groups. Additionally, potential impacts on each of the stakeholder groups are discussed. At this point, it has to be noted that only the findings related to consumers are empirically verified. Information regarding the other stakeholders is extracted from the expert interviews and refined through findings from the literature.

Consumers:

Regarding a medicine delivery platform, consumers value an easy-to-use solution that is useful to them. To stimulate consumer interest, it thus has to provide some type of added value to them. In the scope of this research, time savings and increased medicine accessibility are identified as such. Especially to consumers with low mobility, the proposed platform solution is expected to offer significant added value. Additionally, the cost factor of the proposed platform solution is important to the consumer. To drive adoption rates, it is thus important to keep the costs as low as possible. Another benefit to the consumer is more personalized patient care by the doctor enabled by a feedback loop regarding the effects of a medication or treatment. And although most of the respondents of the consumer survey of this research indicate little to no data privacy concerns it is important to prioritize consumer data protection to achieve high levels of consumer trust. Finally, it has to be mentioned that the social risk of further excluding the elderly, as well as people with limited mobility, from society, is amplified by launching such a platform.

Doctors:

To doctors, the ease of use of the platform solution, as well as the time-savings aspect are of utmost importance. Additionally, the software to operate the platform needs to be easily integrable into the existing doctor's office software. On the one hand, the potential added benefit of more effective and efficient patient care, as well as the opportunity to create a feedback loop with the consumers and the pharmacies is found to be highly intriguing to the doctors. Thus, the feedback loop would allow for more personalized patient care. On the other hand, technological – and legal risks are rather unsettling to doctors. Thus, uncertainty regarding legal liability has to be cleared up. Overall, it is of utmost importance for the success of the proposed platform to convince potentially hesitant doctors of the added value provided by the solution. Additionally, a support system has to be set up to assist doctors during the early stages of adoption.

Pharmacies:

Pharmacies could view the proposed platform solution as a threat to their market. Therefore, it is important to include them in the development process of it, whilst providing them with insights on the potential benefits to them. Revenues are expected to rise through providing the pharmacies with a fixed income arising from consumers taking long-term prescription medicine. Thus, making medicine more accessible to the consumer is in the interest of the pharmacies. Another benefit to the pharmacies is the increased accuracy of prescriptions enabled through interactive, digital communication with the doctors. Additionally, time savings enabled by a better alignment of the stakeholders are found to be significant to the pharmacies. Finally, the pharmacies need an easy-to-use solution with a support system in place during the early stages of adoption.

Pharmaceutical Industry:

Although the pharma industry is in support of making medicine more accessible to the consumer, it is found to have a rather indifferent opinion on the proposed platform concept, as its market share is not affected by it. Anyhow, a scalable, inclusive platform solution is acknowledged to benefit all of the stakeholders involved. Finally, one has to note that even if the pharma industry remains rather indifferent towards such a platform, it is still of utmost importance to involve them in the development process and get the industry's approval and support from an early stage to foster growth and usability.

Social Insurances:

To the social insurances, it is important to keep stakeholder interest at the core of the conceptualized platform. Thus, a collaborative and inclusive development approach is proposed. Additionally, the importance of providing an easy-to-use interface to all of the parties involved is pointed out by social insurances. The added value of the platform is mentioned to be especially relevant to risk groups of COVID-19. Finally, the launch of a pilot program is proposed, to further identify added value.

5.4 Limitations

The research instruments used for this thesis provided the researcher with valuable insights. However, both of the primary tools of research carry limitations that need to be addressed.

The convenience sampling approach selected for the consumer survey disallows for generalization of the findings from the sample to the general population. Moreover, the sample size was comparatively small, which further limits the generalization of the findings. Additionally, consumer surveys bear the risk of untruthful answers by the respondents. This risk is especially relevant to the surveys that are filled out online, without the presence of an interviewer, as uncertainty arising from a question cannot be cleared up right away.

Regarding the expert interviews, the main limitation is the time-intensive nature of conducting and analyzing them. Furthermore, interviews have to be conducted in real-time, and thus, in contrast to a survey, only one interview can be conducted at a time. Additionally, a subconscious bias can arise from the way questions are asked by the interviewer. Thus, asking a question a certain way could lead to a biased answer by the interviewee. And even though interviewees have been anonymized throughout the main body of this thesis, their names will be stated in the appendix, if agreed upon priorly. This could also lead to potentially biased answers by the interviewees. Finally, no representatives of the chamber of pharmacies and the chamber of doctors are interviewed which could enhance skewed data. However, the researcher asked the other interviewees to share their thoughts on the impact of the platform on all of the other stakeholders as well, to maximize the information retrieved from each of the interviews.

6 CONCLUSION

The last chapter of this thesis provides a summary of the research. Implications are drawn, and recommendations are made accordingly. Moreover, potential future research regarding the topic is mentioned.

6.1 Summary

Commonly, innovation in the healthcare sector is held back by complicated legal frameworks and guidelines, as well conflicts of interest between the stakeholders. Digital health innovation has however experienced impressive growth over the past decade. This trend has further been accelerated by the COVID-19 pandemic, during which digital health solutions became a necessity. Subsequently, all of the stakeholders of the healthcare sector became increasingly aware of the benefits digital health solutions can provide. Thus, digital health solution adoption rates are expected to experience further growth post-COVID.

This research raised the research question "How would the implementation of a medication delivery platform be perceived by consumers, doctors, pharmacies, the pharma industry, and social insurances in Austria, and what kinds of effects/impacts can be expected on the different stakeholder groups?". To answer the research question, a medication delivery platform concept was introduced to the stakeholders and subsequently, their perception towards it, as well as the possible effects on each of the stakeholder groups, were analyzed. Firstly, literature regarding the topics of consumer behavior, healthcare innovation, and the current state of play regarding digital health was reviewed. Secondly, a conceptual framework was developed, from which eight hypotheses were derived. All of the hypotheses related to consumer perception and were validated through the use of data collected from a consumer survey. However, to provide a comprehensive representation of the stakeholders' opinions regarding the concept, a mixed-methods approach consisting of a consumer survey, as well as expert interviews, was chosen. Thus, six experts were interviewed and in thus encouraged to present their opinions and ideas regarding the topic. Lastly, findings from the consumer survey and the expert interviews were synthesized.

The analysis of the consumer survey highlighted the variance in consumer needs, as well as the importance of identifying a target group that perceives the platform concept to be useful to them. Additionally, consumers valued an easy-to-use solution that is authentic and operates lawfully. Low costs, as well as time savings, were identified as further factors of importance to the consumers.

From the expert interviews, it became evident that the stakeholders of the healthcare sector are aware of the complex framework and are looking to find solutions enabling more efficient innovation. Additionally, data security was at the heart of the concerns of the experts.

Furthermore, the legal – and technological risks of such a platform need to be clarified. Prescription medicine abuse, as well as the potential social risk of further excluding the elderly, as well as people with limited mobility, from society, were mentioned. Moreover, the experts agreed that high costs arising from the complexity of the proposed platform could hinder consumer willingness to adopt. This finding was expanded upon, as the experts found that a large part of Austria's population is not prepared to pay for health innovation out of their pocket yet. However, besides the challenges mentioned above the experts also proposed possible solutions to overcoming them. Therefore, all of the experts agreed that the inclusion of the whole value chain of stakeholders in the development process of the platform was of utmost importance to its success, as it ensured that the parties' interests were at the heart of the solution. Similarly to the consumers, the experts valued an easy-to-use solution that is easily integrable into the present software solutions. To help the stakeholders during the early stages of adoption, a support system was proposed by the experts. To eliminate the cost factor, the experts mentioned the importance of gaining the support of Austria's social insurances. Additionally, a state-of-the-art supply chain, ensuring safe delivery of the medicine to the consumer was proposed by the experts. Overall, the increased accessibility of medicine, as well as time-efficiency benefits, and the creation of a new market space were mentioned as the main benefits of such a platform by the experts. The impact of the COVID-19 pandemic on digital health innovation was largely acknowledged by the experts. Thus, the experts stated that the pandemic acted as a trigger for more digital health innovation, and expected this trend to continue post-COVID. Regarding the future of digital health, the experts mentioned decision-making processes and predictions to be increasingly supported by digital health tools. Additionally, a switch from preventive care to proactive care was proposed. Finally, the experts stated telemedical care as an important pillar enabling more effective use of the healthcare systems resources.

6.2 Contribution to knowledge

Previous research has focused on analyzing only one stakeholder perspective at a time rather than providing a complete picture of the various stakeholder perspectives regarding digital health innovation. Furthermore, there is no prior research regarding the impacts of a medication delivery platform on the stakeholder groups of the healthcare sector.

6.3 Implications for relevant stakeholders

Regarding the platform concept discussed throughout this research, many factors influencing stakeholder perception and - behavior have to be considered. This subchapter discusses these factors.

Firstly, it is of utmost importance to develop a platform solution that is easy to use for all of the stakeholders involved, as well as easily integrable into existing software solutions. Findings from

both the consumer survey, as well as the expert interviews stress the impact of perceived ease of use on stakeholder willingness to adopt.

Secondly, to drive a more effective allocation of the healthcare system's resources, it is important to develop the platform in a way that it can be operated at a low cost whilst improving the effectiveness of patient care. Additionally, the platform solution needs to enable the consumer to save time as well.

The third finding is that data privacy measures need to meet the highest standards to gain stakeholder trust. Additionally, legal liability questions regarding the recommendation and use of the platform need to be cleared up.

Lastly, it is recommended to involve all of the relevant stakeholder groups in the development process of the platform. This keeps stakeholder interests and needs at the heart of the concept, whilst also enabling the developers to convince the stakeholders of the added value the platform provides from the early stages of development.

6.4 Future research

This research provides new insights into stakeholder perception of digital health innovation – in this case, the proposed platform solution. However, it has to be mentioned that the relatively small sample of 97 respondents does not allow for the generalization of the findings. Furthermore, only six experts have been interviewed, which also restricts the generalizability of the findings to the entire healthcare system.

Further research regarding the topic of stakeholder perception of digital health innovation is recommended to be conducted on a larger scale, to confirm or deny the recommendations made in this research. Additionally, research on stakeholder acceptance of digital health solutions is recommended. Furthermore, a thorough analysis of regulations regarding digital health innovation is recommended. This would allow for the exact identification of barriers hindering innovation. Additionally, research regarding the impact of demographic and social factors on the perception of digital health innovation is recommended. Subsequently, identifying highly interested consumer groups within a specific region could allow for the launch of a pilot project regarding a medication delivery platform.

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APPENDICES

Appendix I: Consumer Survey (German Version)

Masterarbeit Konsumenten Fragebogen

Einwilligungserklärung gemäß Datenschutz für eine Umfrage zum Thema "Lieferdienste für Medizin in Österreich":

In der folgenden Umfrage möchte ich Ihnen ein paar Fragen zum oben genannten Thema stellen. Ziel der Umfrage ist es, Ihre Beweggründe für oder gegen die Nutzung einer Medizin Lieferungs-Plattform besser bewerten zu können.

Im Zuge der Umfrage wird auch nähere Information zu Ihrer Person abgefragt, um dadurch bei den Ergebnissen auch soziale Faktoren (Alter, Berufsstand, Ausbildung) einbeziehen zu können.

Die Teilnahme an dieser Umfrage ist ohne die Nennung Ihres Namens möglich.

Eine Registrierung ist für die Teilnahme nicht erforderlich.

Sie haben gemäß Datenschutz gegenüber dem Informationsträger das Recht auf Auskunft sowie Löschung Ihrer personenbezogenen Daten. Durch das fortfahren auf den nächsten Abschnitt, stimmen Sie der Teilnahme und Verwendung Ihrer Daten zu. Sie können diese Einwilligungserklärung jederzeit widerrufen. Treten Sie hierzu mit dem Forscher per E-Mail (daniel.mittheis@gmail.com) in Kontakt. Nach erfolgtem Widerruf werden Ihre Daten gelöscht und unzugänglich aufbewahrt.

Die gesammelten Daten werden passwort-geschützt auf dem Laptop des Forschers gespeichert und im August 2021 unwiderruflich gelöscht.

Die Masterarbeit & Das Szenario

Sehr geehrte Teilnehmer,

Mit Ihren Antworten unterstützen Sie den empirischen Teil meiner Masterarbeit zum Thema "die Wahrnehmung einer Plattform zur Lieferung von Medikamenten in Österreich und deren potentielle Auswirkungen auf verschiedene Interessengruppen."

Bitte versetzen Sie sich zur Befragung in die folgende Lage:
Sie sind bei Ihrem Hausarzt und bekommen ein Medikament verschrieben. Der Arzt stellt Sie vor die Wahl aus folgenden Möglichkeiten:
1) Sie holen Ihre Medikamente eigenständig aus der Apotheke ab.
2) Ihre Medikamente werden Ihnen am Tag des Arztbesuches durch die Verwendung einer Plattform direkt nach Hause geliefert.

Bitte denken Sie über Faktoren, die Ihre Entscheidung beeinflussen nach und beantworten Sie die aufgelisteten Fragen entsprechend.

Es gibt hier keine "richtigen" oder "falschen" Antworten. Ich bin an Ihrer persönlichen Meinung interessiert. Der Fragebogen ist anonym und die Beantwortung sollte nicht länger als 3-4 Minuten dauern.

Vielen Dank für Ihre Teilnahme!

Demographische Fragen

:s.google.com/forms/d/1_D8iSbKpqzpmIEpaGhYZepKeItJYILtKeczZzVZropM/edit?ts=5fbbac89&gxids=7757

Masterarbeit Konsumenten Fragebogen

1. Wie alt sind Sie?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] 15-20
- [ ] 21-30
- [ ] 31-40
- [ ] 41-50
- [ ] 51-60
- [ ] 61-70
- [ ] 71-80
- [ ] 80+

2. Geschlecht:

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Männlich
- [ ] Weiblich
- [ ] Anderes
- [ ] Keine Angabe

3. Höchste abgeschlossene Ausbildung:

Wählen Sie alle zutreffenden Antworten aus.

- [ ] kein Pflichtschulabschluss
- [ ] Pflichtschule
- [ ] Lehrabschluss
- [ ] Berufsbildende mittlere Schule **ohne** Matura (z. B. Handelsschule, 3 jährige HBLA)
- [ ] Allgemeinbildende oder berufsbildende höhere Schule mit Matura (z. B. Gymnasium, HAK, HTL)
- [ ] Universität/Fachhochschule

4. Arbeitsstand

Markieren Sie nur ein Oval.

- ◯ Berufstätig
- ◯ in Ausbildung
- ◯ Arbeitslos
- ◯ In Pension

5. Wie hoch ist Ihr monatliches Einkommen?

Wählen Sie alle zutreffenden Antworten aus.

- ☐ € 0 - € 1.000
- ☐ € 1.100 - € 2.000
- ☐ € 2.100 - € 3.000
- ☐ € 3.100 - € 4.000
- ☐ € 4.100 - € 5.000
- ☐ € 5.000 +
- ☐ keine Angabe

Hauptteil

6. Ich verwende mein Smartphone täglich.

Wählen Sie alle zutreffenden Antworten aus.

- ☐ Ja
- ☐ Nein
- ☐ Ich habe kein Smartphone.

7. Ich verwende meinen Laptop täglich.

Wählen Sie alle zutreffenden Antworten aus.

- ☐ Ja
- ☐ Nein
- ☐ Ich habe keinen Laptop.

8. Nehmen Sie regelmäßig Medikamente ein?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Ja
- [ ] Nein

9. Nehmen Sie verschreibungspflichtige Medikamente ein?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Ja
- [ ] Nein

10. Wie oft nehmen Sie Medikamente ein?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Täglich
- [ ] Mehrmals die Woche
- [ ] Einmal die Woche
- [ ] Selten
- [ ] Nie

11. Die Abwicklung von der Medikamentenverschreibung bis zur Abholung in der Apotheke ist einfach.

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

12. Ich bin mobil genug, meine Medikamente jederzeit selbstständig von der Apotheke abzuholen.

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

13. Meistens hole ich Medikamente für ... ab:

Wählen Sie alle zutreffenden Antworten aus.

- [ ] mich
- [ ] jemand anderes

14. Falls Sie mit "jemand anderes" geantwortet haben bitte ich um eine kurze Begründung im Textfeld unter dieser Frage:

15. Die nächst gelegene Apotheke ist Fußläufig in 5 Minuten erreichbar.

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Ja
- [ ] Nein

16. Haben Sie bereits Medikamente online bestellt?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Ja
- [ ] Nein

17. Personen aus meinem näheren Umfeld holen meine Medikamente für mich aus der Apotheke ab.

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Oft
- [ ] Manchmal
- [ ] Selten
- [ ] Nie

18. Generell wäre ich an einer Plattform zur Lieferung von Medikamenten interessiert

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

19. Beim Verwenden einer online Plattform für die Lieferung von Medikamenten hätte ich Bedenken bezüglich Datenschutz und Privatsphäre .

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

20. Die Seriosität und Authentizität einer Plattform zur Lieferung von Medikamenten ist mir wichtig.

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

21. Die Plattform sollte leicht zu verwenden sein.

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

22. Der Kostenaspekt einer solchen Plattform ist wichtig für mich.

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

23. Die Zeitersparnisse durch die Verwendung einer solchen Plattform sind wichtig für mich.

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

24. Für mich wäre eine solche Plattform nützlich.

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

25. Für mich wäre es wichtig, dass ich zur Verwendung der Plattform keine digitalen Geräte benötige (Smartphone/Laptop/Tablet/etc.)

Markieren Sie nur ein Oval.

	1	2	3	4	
Trifft zu	◯	◯	◯	◯	Trifft nicht zu

Appendix II: Consumer Survey (English Version)

The Scenario

Dear participant,

Please try to picture the following situation:
You are at the doctor and get a prescription. The doctor lets you choose from the following scenarios:
1) You can pick up your medication from the pharmacy on your own.
2) Your medication will be delivered to your home, on the day of your doctors' appointment, through the use of a medication delivery platform.

Please think of factors, that might influence your decision and answer the questions below accordingly.

Note that there are no right or wrong answers here. The researcher is interested in your personal opinion. You can participate anonymously and answering the questions should take no longer than 3-4 minutes.

Thank you for your participation!

Demographical Questions

1. How old are you?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] 15-20
- [ ] 21-30
- [ ] 31-40
- [ ] 41-50
- [ ] 51-60
- [ ] 61-70
- [ ] 71-80
- [ ] 80+

2. Gender:

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Male
- [ ] Female
- [ ] Other
- [ ] Prefer not to answer

3. Highest educational attainment:

Wählen Sie alle zutreffenden Antworten aus.

- [ ] No compulsory education
- [ ] Compulsory education
- [ ] Apprenticeship
- [ ] Vocational School
- [ ] Highschool
- [ ] University/College

4. Employment Status

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Employed
- [ ] Student/in training
- [ ] Unemployed
- [ ] Retired

5. What is your monthly disposable income?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] € 0 - € 1.000
- [ ] € 1.100 - € 2.000
- [ ] € 2.100 - € 3.000
- [ ] € 3.100 - € 4.000
- [ ] € 4.100 - € 5.000
- [ ] € 5.000 +
- [ ] Prefer not to answer

6. I use my smartphone on a daily basis.

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Yes
- [ ] No
- [ ] I do not own a smartphone.

7. I use my laptop on a daily basis.

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Yes
- [ ] No
- [ ] I do not own a laptop.

8. Do you regularly take Medication?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Yes
- [ ] No

9. Do you take prescription Medicine?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Yes
- [ ] No

10. How often do you take Medicine?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Daily
- [ ] Multiple times per week
- [ ] Once a week
- [ ] Rarely
- [ ] Never

11. The process from being prescribed medicine to picking up from the pharmacy is simple.

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

17. People from my immediate surroundings pick up my medication from the pharmacy for me.

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Often
- [ ] Some times
- [ ] Rarely
- [ ] Never

18. In general, I would be interested in a medication delivery platform.

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

19. I would have privacy/data concerns when using such platform.

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

20. The respectability and authenticity of such platform would be important to me.

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

21. The Platform should be easy to use.

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

22. The cost aspect of such platform is important to me.

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

23. Saving time through using this platform is important to me.

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

24. I would perceive such platform to be rather useful to me.

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

25. It would be important to me that the use of such platform does not require having a digital device (Smartphone/Laptop/Tablet/etc.).

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

12. I am mobile enough to pick up the medication I need from the pharmacy myself, whenever I need it. (only relevant when answering online)

Markieren Sie nur ein Oval.

	1	2	3	4	
Strongly Agree	◯	◯	◯	◯	Strongly Disagree

13. Most of the time, I am picking up medicine for:

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Myself
- [ ] Someone else

14. If you answered "someone else" in the question above please elaborate your reasons for it here:

15. The closest pharmacy to my home is in the vicinity of a 5 minute walk.

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Yes
- [ ] No

16. Have you ordered medicine online before?

Wählen Sie alle zutreffenden Antworten aus.

- [ ] Yes
- [ ] No

Appendix III: Expert Interview Guideline

Expert Interviews

Dear Participant,

You have been chosen because you are an expert in the field of healthcare innovation.

During this Interview, the researcher will ask questions concerning the implementation of a medication delivery platform in Austria, the stakeholder perception towards it, and expected impacts on the different stakeholder groups. The goal of this interview is to get a better understanding of the topic by the help of your insights.

Throughout the main body of text of my Master's Thesis your name will be anonymized. However, it has to be included in the appendix section of the thesis.

Please let me know, if I can record the interview. Your consent to this would massively help me during the transcription process.

According to data protection laws you have the right to request your answers and personal data to be deleted at any time. To make use of this right, please simply contact the researcher via E-Mail (daniel.mittheis@gmail.com).

The collected information will be password protected on the researcher's laptop and deleted irrevocably in August 2021.

The Topic

As mentioned above, the Master's Thesis deals with the topic "the implementation of a medication delivery platform in Austria, the stakeholder perception towards it and expected impacts on the different stakeholder groups."

The purpose of the thesis is to investigate current perception levels of the implication of a medication delivery platform in Austria, from the perspective of consumers, pharmacies, doctors and the pharmaceutical industry, as well as factors influencing them. To answer the research question accordingly, 4 stakeholder groups have been identified: consumers, doctors, pharmacies and the pharmaceutical industry. Furthermore, socio-political, ecological and sustainability related factors will be analyzed.

The topic was inspired by people with limited mobility struggling to efficiently receive their medicine. The Covid-19 pandemic has further increased the importance of this topic, in the perception of the researcher.

The goal of the thesis is to get a better understanding of the differences in perception, concerning the implication of a medication delivery platform, from the perspectives of the above-mentioned stakeholders.

The thesis is written under the supervision of Dr. Sabine Sedlacek at Modul University Vienna.

Interview Questions

1. What is your professional background?

2. What is your relation to digital health innovations and how is it based on your background knowledge?

3. Do you perceive healthcare innovation as relatively complicated or simple? Why?

4. What are some chances/opportunities provided to your branch through digitalization in the healthcare sector?

5. How would you and your branch perceive the introduction of a medication delivery platform? Why?

6. What would be some advantages/disadvantages for the different stakeholder groups, when introducing such platform?

7. What would be the main risk factors when introducing such platform?

8. How would such platform have to be structured/set up to maximize its potential?

9. How do you perceive the impact of the CoVid-19 pandemic on digital health innovation?

10. What are some chances/opportunities provided through digitalization to other stakeholders in the healthcare sector?

11. How do you think the other stakeholders (consumers, pharmacies, doctors and the pharmaceutical industry) would perceive the introduction of a medication delivery platform? Why do you think they will perceive it in that way?

12. How do you envision the future of digitalization in the health sector?

Appendix IV: Expert Interview Bullet Points

Expert 1 Anonymous and Expert 2 Mag. Pharm. Haidmayer:

Question	Mag. Pharm. Haidmayer	Anonymous
What is your professional background?	Worked in pharmacies for years then opened his own pharmacy in Vienna in 1992	Studied biology, started pharma career in 2004 joining a clinical trials research group, later on became program and project manager, worked as a medical advisor and medical lead for vaccines since 2013.
What is your relation to digital health innovations and how is it based on your background knowledge?	During his time as a pharmacist -> ELGA was launched (early phase of digital health)	Digital health is rather data related in his field. Data sometimes translates into digital health innovations. (Communication of data) Another aspect are digital communication tools that help work interaction with scientific leaders, stakeholders & colleagues.
Do you perceive healthcare innovation as relatively complicated or simple? Why?	In general, very complicated and slow	Complex framework Data privacy The creation of health related apps -> strict legal frameworks and regulatory constraints. Big and necessary hurdles when it comes to data and information all throughout the pharma industry -> is a good measure but complicates innovation (long development time, high effort and cost)
What are some chances/opportunities provided to your branch through digitalization in the healthcare sector?	More efficient patient care	Digitalization accelerates data driven, evidence based decision making within research groups. Deep learning and AI, as well as bots support research. Helps extract

		valuable information from an immense cluster of information. Digitalization supports showing evidence of vaccination programs, therapeutic schemes, and lifestyle proposals for ill patients (especially relevant to chronically ill patients, e.g. diabetes). The more data -> the more precise the prediction Could enable an online on-going monitoring, as well as a better outcome of the therapy by constantly adapting the therapeutic scheme.

How would you and your branch perceive the introduction of a medication delivery platform? Why?	Pharmacists have to be included; should be a non-threat to pharmacies	Retail train is not part of the business model in most pharma concerns. Therefore, the pharma industry is rather less affected by the introduction of such platform. However, innovations that improve accessibility of medicine are highly welcomed by the industry.
What would be some advantages/disadvantages for the different stakeholder groups, when introducing such platform?	More accurate prescriptions	Advantage to people adaptive to new, digital solutions Pharmacies live from consultancy; they attract consumers by offering personalized consulting -> pharmacies might perceive platform as a threat Making medicine more accessible

What would be the main risk factors when introducing such platform?	Potential abuse of prescription medicine	Data privacy, possible creation of market disadvantage/advantage to certain pharmacies
How would such platform have to be structured/set up to maximize its potential?	Low cost, ease of use, efficient delivery system, think about ELGA and eCard as basic support systems Enable support system for consumers (chat bots, hotline)	Provide low barrier access to the medicine Ensure that medicine is handled carefully during the delivery Ensure state-of-the-art quality of delivery Think about impact on traffic/utilization rates of delivery services Ensure no pharmacies are left behind (especially applicable to pharmacies that are located rather remotely)
How do you perceive the impact of the Covid-19 pandemic on digital health innovation?	-	Increase in Telemedicine adaption rates Prescription via telephone was made possible
What are some chances/opportunities provided through digitalization to other stakeholders in the healthcare sector?	-	Increased optimization and speed of processes/treatments More data can be analyzed
How do you think the other stakeholders would perceive the introduction of a medication delivery platform? Why do you think they will perceive it in that way?	-	Pharmacies: added value; discussed above Doctors: if administration is made more complicated through the platform -> reluctant Any new system would have to be integrated into existing software solutions for doctor's offices Patient interactions are commonly short for general practitioners -> time needs to be used effectively

		Possible added value for doctors Consumers: accessibility Pharma: indifferent
How do you envision the future of digitalization in the healthcare sector?	-	Telemedicine will remain in place Inter-connection Networking Decision-making tools supporting governmental decisions Registries to gather large amounts of data Health apps -> possibility to connect to social security system

Expert 3 Mr. Sivagnanam, FCCA CEDR and Expert 4 Dr. Fialka:

Question	Mr. Sivagnanam, FCCA CEDR	Dr. Fialka
What is your professional background?	Started working in healthcare 24 years ago, started digital healthcare startup 5 years ago -> v-doc	CEO of IniTS -> high tech incubator of VIE and all universities in VIE; helps research heavy startup founders to scale up effectively. Molecular biology background + business background (focus on entrepreneurship) Inits does matchmaking between founders and intellectual property since 2017 Investment only in incubies 2017 -> launch of health hub Vienna
What is your relation to digital health innovations and how is it based on your background knowledge?	-	-
Do you perceive healthcare innovation as relatively complicated or simple? Why?	Complicated; healthcare guidelines differ globally; litigation is an issue; big differences between developing and developed countries in terms of applying innovations	Healthcare system is realtively complex because of data security and GDPR, as well as legal frameworks (e.g. doctors liability); technological risk; slow market adoption (convincing users takes longer than in other industries), often startups don't comply with public procurement -> bias towards co-operating with big concerns; because the healthcare system is public in Europe each system varies nationally – in the DACH region this is further complicated through differences on the state level -> hard to scale.

		Complex system of approval of European regulatory bodies -> conflict of interest as patients have to be safe, but innovation is held back. Innovations can pose threat in terms of legal liability (e.g. doctor suggesting an innovation to patient) -> possible lawsuits Who pays for the innovation? (as a barrier) -> social insurances in Austria are not prepared to pay for digital solutions yet Only a small part of the population can afford to pay for health innovation out of their own pocket -> social insurance = key to more innovation, as it eliminates the price factor

What are some chances/opportunities provided to your branch through digitalization in the healthcare sector?	Better alignment of stakeholders (especially during CoVid); increased efficiency/productivity	-
How would you and your branch perceive the introduction of a medication delivery platform? Why?	-	Greatly depends on technological solution. Has to be thought through very carefully. Consider: how does digital prescription work at the moment? (enables doctor to send prescription to pharmacy; patient can then pick it up)
What would be some advantages/disadvantages for the different	Better alignment of stakeholders (especially during CoVid); increased efficiency/productivity; better long-term treatment; for consumers: accessibility,	Doctors -> legal liability, possible lawsuits when recommending innovations

stakeholder groups, when introducing such platform?	inclusion of less mobile patients, besides education, healthcare is one of the most important factors in terms of quality of life for consumers as citizens; doctors: less time spent per patient is important because of aging population and not enough doctors coming through the system quick enough - takes pressure of the healthcare system, more effective use of doctors resource management across a country. Pharmaceuticals: have a political motivation, ultimately will hold innovation back if they perceive it as a threat, have a very powerful bargaining position	Consumers -> potential time efficiency benefits Pharmacy -> could be a benefit in terms of fixed income from patients consuming long-term medication; digital prescription saves time; more efficient communication between parties; could be a new business model relevant to pharmacists Doctors -> more efficient communication with patients and pharmacies; time savings
What would be the main risk factors when introducing such platform?	possible lawsuits if something goes wrong; ensuring the correct customer gets the correct medicine	Social risk -> isolation of immobile/elderly people from society. Risk of law suits Data safety -> patient data = most sensitive data (personal information + data of diseases medication and treatment)

		medication and treatment)
How would such platform have to be structured/set up to maximize ist potential?	The e-record should be built upon (patient record accessible to any doctor); has to be scalable to the point where it can be used anywhere and linked to those records; needs to include the whole value chain of stakeholders; ease of use for all of the stakeholders is important; think about who is controlling it and the follow-up process; repeat prescription automating -> very	Include some type of social interaction for elderly/immobile No overengineering Look at direct competition solutions in place (like neighbors help neighbors platform) Look at substitutions (e.g. private care passing by a pharmacy anyways -> not as much time lost)

	important part of the platform; including generic, non-prescription medication on the platform	Maybe these solutions need to be combined to find the optimal solution for such platform Keep cost low The structure behind the surface -> can ensure safety (e.g. blockchain) The usability of the surface is the order winner -> easy to use for all involved parties (especially by elderly and people with some type of disability; has to interlink with various doctors' office software) Communication in terms of selling it to consumers has to be well prepared (getting doctors on board to recommend to patients)

How do you perceive the impact of the Covid-19 pandemic on digital health innovation?	Rapid increase in adoption of digital health and usage rates	Need to use digital health became apparent People used technologies that were unsafe to communicate with their doctors (Whatsapp) Although technologies exist, there was a threat of still complying with laws and regulations. Showed that the healthcare system is operating on the verge of financial stability (elderly care will not be covered for to the same extent in the future) Post pandemic -> positive trend of more digital health will continue

		Digital vaccination pass, digital prescription will likely remain
What are some chances/opportunities provided through digitalization to other stakeholders in the healthcare sector?	-	
How do you think the other stakeholders would perceive the introduction of a medication delivery platform? Why do you think they will perceive it in that way?	Doctors -> positive because more efficient time use, generational change will enhance use of digital healthcare innovation	Consumers -> immobile people are being taken care of by people in their inner circle -> we do not want to exclude them completely from having social contacts. CoVid already created damage in terms of isolating elderly and/or immobile people. Factor of potential further isolation through delivery platform has to be considered. -> potential negative impact on psyche
How do you envision the future of digitalization in the healthcare sector?	Speaking to your doctor virtually from home, order medicine through platform that connects stakeholders, deliver medicine through drones within a short timeframe after	Social insurance = key to more innovation, as it eliminates the price factor. More digital health in the future Increase efficiency through digital health care -> enables focus of human resource tasks on the most important things that NEED to be done by humans and cannot be done virtually -> reducing the costs while keeping the quality high -> cannot be done without digital health Generally, a lot of potential Telemedical solutions to handle elderly and chronical care

		Patient enablement -> enable people to live healthier (preventive care -> move from sick care to healthcare) Include patients in decision making process of treatment/preventive steps -> personalized domain

Expert 5 Dr. Mauersberger and Expert 6 Dr. Trostmann:

Question	Dr. Mauersberger	Dr. Trostmann
What is your professional background?	Studied pharmacy in Germany, worked in pharmacies for 3-4 years; promotion studies in Austria; since 2015 working at OEGK in the department medical treatment economy -> deals with economical questions of treatment – how to treat patients more efficiently	General practitioner, occupational physician & school doctor
What is your relation to digital health innovations and how is it based on your background knowledge?	Digital health innovations are not directly related to the area of expertise of Dr. Mauersberger.	No relation to digital health innovations; started using laptop for prescription this year using the electronic vaccination record It is not common for general practitioners to use digital health innovations at this moment in time
Do you perceive healthcare innovation as relatively complicated or simple? Why?	-	-
What are some chances/opportunities provided to your branch through digitalization in the healthcare sector?	-	-
How would you and your branch perceive the introduction of a medication delivery platform? Why?	Depends on how the platform is set up. Important to keep stakeholder interests in mind. If there is a true value -> could be beneficial to the OEGK Personal patient consultation must remain intact -> information about how to take prescription has to be readily offered to patient; patient will most likely not ask otherwise	In support, as there is a perceived benefit of more effective and efficient patient care. During the Covid pandemic doctors were enabled to send prescriptions directly to the pharmacy for their patients so that the patients did not have to go see their doctor every time when they needed their prescription refilled -> very helpful to doctors

What would be some advantages/disadvantages for the different stakeholder groups, when introducing such platform?	Consumer/patient -> especially to risk groups incredibly valuable during Covid-19; eases the process of receiving medicine Shipping of medicine from one main depository to the consumer can take a few business days -> lead time would be significantly reduced by the platform model Pharmacies -> questionable if they would support it Online pharmacies -> are waiting for restrictions by the government to allow them to ship prescription medicine -> could likely see this platform as a threat	Potential to warn in case of potential issues when using multiple medicines simultaneously Potential feedback loop -> how well did the medicine work; does dosage need to be adapted, etc.
What would be the main risk factors when introducing such platform?	Data privacy -> another player that would receive critical patient data; consumer has to be sure that data is save Accessibility in terms of technological complexity has to be kept low to meet consumer needs (especially relevant to older consumer groups) Regulatory aspect -> extremely complex Potentially high cost caused by complex regulations and logistics	Human error risk remains

How would such platform have to be structured/set up to maximize its potential?	Logistics have to be kept in mind -> some medicine has to be cooled during delivery process Every stakeholder has to be on board to make such platform work in practice -> setting it up against the will of one or more of the stakeholder groups is nearly impossible Decide on a concept and try it out using a pilot project	Has to be very easy to use for all of the stakeholders Has to be easily integrated into the software used at doctor's offices
How do you perceive the impact of the Covid-19 pandemic on digital health innovation?	OEGK supported the enablement of receiving prescription via remote diagnostics. However, not personally going to see a doctor can also have downsides -> e.g. potentially people did not go to see a doctor during the pandemic, when otherwise they would have gone.	-

	project	
How do you perceive the impact of the Covid-19 pandemic on digital health innovation?	OEGK supported the enablement of receiving prescription via remote diagnostics. However, not personally going to see a doctor can also have downsides -> e.g. potentially people did not go to see a doctor during the pandemic, when otherwise they would have gone.	-
What are some chances/opportunities provided through digitalization to other stakeholders in the healthcare sector?	-	-
How do you think the other stakeholders would perceive the introduction of a medication delivery platform? Why do you think they will perceive it in that way?	Answered above	For elderly patients -> has to be very easy to use and need support in early stages of adaption; possibly need of introducing different tools for different age groups (elderly get simpler version of platform) Could enhance communication between pharmacists, doctors and social insurers

How do you envision the future of digitalization in the healthcare sector?	-	-
Do you think there would be a chance that the OEGK supports such platform and offers subvention?	OEGK is regularly supporting pilot projects that aim at making healthcare more efficient. However, before the interest groups have to be clearly defined For patients that would in fact benefit from such platform, there is a good chance that the cost could be subsidized by OEGK.	-
How did the Covid Pandemic affect your profession?	-	More time and cost intensive patient care due to increased security measures Many patients were reluctant to see their doctors during the acute phases of the pandemic -> doctors earned less income This lack of doctor patient interaction led to a risk of neglecting preventive medical check-ups which could have a potential negative impact on the healthcare system in the future.

Appendix V: Thematic Cluster Analysis

Anonymous	Mag. Pharm. Haidmayer	Mr. Sivagnanam, FCCA CEDR
Concepts		
Big data	ELGA	
Collaborative working		Better allignment of stakeholders
Complex healthcare framework	Complex healthcare framework; slow	Complex healthcare frameowrk
Legal/regulatory constraints		Wide variety of healthcare guidelines globally
Decision making		
Predictions enabled by data		
Long time treatment patients		better long-term treatment
Digital natives		
Economic threat to pharmacies	Inclusion of pharmacists in development process	
Increased accessibility of medicine	Potential abuse of prescription medicine	increased accessibility; inclusion of less mobile patients
New market space		
Telemedicine		
Prescription via telephone		
Optimization of treatments	Increased accuracy of prescriptions	increased efficiency/productivity
Potential added value to pharmacies		
Reluctant doctors		
Potential added value to doctors		More effective use of doctors resource management -> less pressure on healthcare system
Indifferent pharma industry		Generational change will enhance use of digital healthcare innovations
Governmental decisions		
Health apps		
Social security system		
State-of-the-art supply chain/delivery	efficient delivery system	ensuring correct consumer gets correct medicine
Data security		
	easy to use	
	low cost	
	Support system for consumers	
		Big differences between developing & developed countries in terms of applying innovations
		Pharma industry as potential block of innovations (if perceived as threat)
		Risk of lawsuits
		e-record as a basis
		immense scalability
		inclusion of whole value chain of stakeholders
		repeat prescription -> important part of platform
		Inclusion of non-prescriptives
		High adoption/usage rates of digital health during COVID
		Drone delivery

Dr. Fialka
Complex healthcare framework; slow market adoption
GDPR; legal framworks; varying healthcare systems
potential benefit of fixed income from patients consuming long-term medicine
potential time efficiency benefits
doctors -> legaly liable when recommending innovation
efficient communications with patients/pharmacies; time savings
structure can ensure safety (blockchain)
Data security; patient data = most sensitive data
easy to use for all parties -> wins orders
no overengineering
technological risk; legal liability
need to use digital health became apparent during COVID
positive trend of more digital health will continue post COVID; digital vaccination pass; digital prescription
Conflict of interests
Cost aspect
Social insurances not prepared to pay for digital solutions yet
Social insurances key to more innovation -> eliminate cost factor
Social risk
Isolation of elderly/immobile from society
inclusion of social interaction
Compare to competition/substitution
well prepared communication strategy
Healthcare system is operating on the verge of financial stability
Patient enablement
Include patients in decision making process of treatment
Personalized treatment

Dr. Mauersberger	Dr. Trostmann
No direct relation to digital health innovations	No direct relation to digital health innovations
Complex healthcare framework	
Regulatory aspect	
potentail value to risk groups during COVID	
	More effective/efficient patient care; time aspect important to doctors; potential feedback loop
Reduced leadtime of medicine shipment	
data privacy -> critical patient data is involved	
easy to use	Easy to use for all stakeholders; easily integrated into doctor's office software
potential high cost caused by complex regulations and logistics	
Logistics of medicine delivery	
Personal patient consultation must remain intact; not seeing doctors can have downsides	
Stakeholder interests need to be kept at the core of developing the platform	
potential benefit to OEGK if true added value is found	
Online pharmacies possibly hindering market entry (threat)	
Conceptualize -> pilot project	
Possible support by OEGK	
	Warn in case of overlaps of medicine that may cause harm
	Human error risk remains