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The diffusion of teleconsultations in Finland

Study of interactions and the balance of social and rational considerations

Economics and Business Administration,
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Master's thesis

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☐ **I have not used any AI-based tools.**

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Abstract

In this thesis I explored how teleconsultations diffused in Finnish healthcare during the Covid-19 pandemic. My goal was two-fold: First I sought to understand the interaction of innovation-, adopter-, and system characteristics that influence diffusion processes. Second, I examined how social and rational reasons to adopt an innovation formed and influenced the diffusion process. Social reasons concern the expected benefits gained from the act of adoption itself, while rational reasons concern the expected benefits arising from the innovation's use.

I approached this topic through a qualitative case study grounded in critical realism. I conducted six semi-structured interviews with physicians and triangulated this data with prior 14 KEMUT interviews as well as public data. I analysed them all with qualitative content analysis. My main findings were that the physicians' perceptions of their role, work, and goals influence how they perceive the innovation's relative advantages. And that social norms influence how observable the innovation's relative advantages are, which in turn influence the balance between social and rational considerations.

My first major contribution to the diffusion literature was through finding several novel interactions between factors important for diffusion and by providing further evidence that these interactions are important for diffusion outcomes. Second, I showed that our prior frameworks regarding the roles of social and rational drivers for diffusion were incomplete. Particularly for innovations such as teleconsultations that do not provide a chance to become an exemplary user.

Keywords: The diffusion of innovations, Teleconsultations, Healthcare, Covid-19, Adoption-decision making, social and rational accounts, interactions.

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Tiivistelmä

Tässä opinnäytetyössä tutkin, kuinka etäkonsultaatiot yleistyivät suomalaisessa terveydenhuollossa Covid-19-pandemian aikana. Tavoitteeni oli kaksijakoinen: Ensinnäkin halusin ymmärtää innovaatioiden, käyttöönottajien ja järjestelmän ominaisuuksien vuorovaikutusta, joka vaikuttaa diffuusioprosesseihin. Toiseksi tutkin, kuinka sosiaaliset ja rationaaliset syyt innovaation käyttöönotolle muodostuivat ja vaikuttivat diffuusioprosessiin. Sosiaaliset syyt liittyvät käyttöönotosta itsestään odotettaviin hyötyihin, kun taas rationaaliset syyt liittyvät innovaation käytöstä odotettaviin hyötyihin.

Lähestyin aihetta kriittiseen realismin ohjaaman kvalitatiivisen tapaustutkimuksen avulla. Tein kuusi puolistrukturoitua haastattelua lääkäreiden kanssa ja trianguloin nämä tiedot aiempien 14 KEMUT-haastattelun sekä julkisten tietojen kanssa. Analysoin ne kaikki kvalitatiivisen sisällönanalyysin avulla. Tärkeimmät havaintoni olivat, että lääkäreiden käsitykset roolistaan, työstään ja tavoitteistaan vaikuttavat siihen, miten he näkevät innovaation suhteelliset edut. Lisäksi sosiaaliset normit vaikuttavat siihen, kuinka havaittavissa innovaation suhteelliset edut ovat, mikä puolestaan vaikuttaa sosiaalisten ja rationaalisten näkökohtien väliseen tasapainoon.

Ensimmäinen merkittävä panokseni levittämistä käsittelevään kirjallisuuteen oli se, että löysin useita uusia vuorovaikutuksia diffuusiolle tärkeiden tekijöiden välillä ja löysin lisää näyttöä siitä, että nämä vuorovaikutukset ovat tärkeitä diffuusion tulosten kannalta.

Toiseksi osoitin, että aiemmat viitekehyksemme sosiaalisten ja rationaalisten tekijöiden roolista diffuusiossa olivat puutteellisia. Erityisesti sellaisten innovaatioiden osalta, kuten etäkonsultaatiot, jotka eivät tarjoa mahdollisuutta tulla esimerkilliseksi käyttäjäksi.

Avainsanat: Innovaatioiden diffuusio, Etävastaanotto, Terveyspalveluala, Covid-19, Sosiaaliset ja rationaaliset selitysmallit, vuorovaikutus.

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1 Introduction

1.1 Background and purpose of the study

Health care systems in Finland and worldwide are experiencing great pressures to innovate and adapt to endure the increasing demands placed on them due to aging populations (Haanperä & Nyström 2020). Telemedicine (TM), which is commonly referred to as delivery of health care remotely (Greenhalgh et al. 2017a) has long been considered one possible part of the solution to this situation (Barlow et al. 2006). It is seen to have potential to reduce costs (Hendy et al. 2014) while maintaining quality of care (Flodgren et al. 2015).

Telemedicine such as teleconsultations (TC) also provide additional benefits like the removal of transportation costs (Nesbitt et al. 2000) and thereby improve the equality of healthcare distribution (Sood et al. 2007). They even hold potential for revolutionary effects as telemedicine can change how health services are delivered (Campion et al. 2016). Alas, the benefits of inventing an auspicious innovation are stifled if they aren't adopted widely (Zhu et al. 2006). Despite several attempts to implement telemedicine around the world only few health care providers had sustained adoption even with strong governmental support. (Standing et al. 2016.) This, however, changed radically following the Covid-19 pandemic (Smith et al. 2020; Chang et al. 2021). Yet, the difficulties experienced in trying to adopt and sustain telemedicines are reflective of a larger problem in health care as despite the aforementioned great needs to innovate the progress in the field has been slow (Christensen 2009).

In order to remedy a problem, it must first be properly understood. The question of how and why an innovation either diffuses in a social system or does not is studied in the diffusion of innovations literature. Innovation refers to any practice, object - such as technology - or idea that the potential adopter was not familiar with beforehand. Diffusion refers to a process in which the innovation is adopted by members of a social system. (Strang & Soule 1998; Rogers 2003.) Thus, the innovation diffusion literature provides a great framework to study, why such innovations as telemedicines have often failed to diffuse in health care despite their expected benefits. Yet, the diffusion literature holds certain limitations.

First, there are competing theoretical perspectives in the literature regarding how an individual or an organization makes their adoption decision. Basically, whether the adoption-decision process is influenced by rational or social considerations. The former would mean adopting due to an expectation of gaining something due to the innovation's technological or other features. Such as being able to do the work more efficiently or with higher quality. In contrast adopting due to social reasons means the adopter expects benefits to arise from the act of adopting rather than from use. Such as being seen as innovative. Perhaps the more complete views include both perspectives and place them on a continuum that is context dependent. (e.g., Ansari et al. 2010.) However, what are the contextual factors that affect which perspective holds true in a given scenario are still under contention as well as if the categorization is valid to begin with.

Second, besides theorizing on the process of diffusion, the literature also includes a conversation on the factors that determine the likelihood an innovation has of diffusing within a social system. These include concepts such as innovation, adopter, and system characteristics. Most of the key factors also seem to have been conceptualized relatively well. (Rogers 2003.) However, in studies regarding health service innovations none of the preformed factors seem to have been associated with innovation diffusion without exemption. Which led to the proposition that what is key for diffusion is not only the specific factors, but how they interact with each other. (Greenhalgh et al. 2004.) Which in simple terms means that how a specific innovation characteristic affects the innovation's likelihood of diffusion depends on the characteristics of the individuals who adopt it and their surrounding system. This is a complex topic and still contains a great deal of unanswered questions.

Both of these aspects of the diffusion literature – that is, the conversation about the theoretical mechanisms behind diffusion process as well as the factors and their interaction which determine the end-result of the diffusion process – are necessary to understand so that diffusion can be better managed. Here in this thesis, I seek to further both of these conversations and I do it by using the case of teleconsultations which in their unusual pattern of diffusion provided a novel perspective on analyzing the diffusion of innovations as well as the field of health care as a system.

The pattern of diffusion studied in this thesis is relatively novel because most of diffusion literature has focused on innovations with successful diffusion patterns (Strang & Soule 1998; Rogers 2003; Naumovska et al. 2021) while most research on telemedicine diffusion studied failed diffusion (Hendy et al. 2007). Thus, as the pandemic radically changed the system of health care's receptiveness toward telemedicine and it diffused widely, a rarely studied pattern of diffusion with a prolonged failure turned to sustained success was formed.

Hence, I was provided with a good opportunity to use the aforementioned theoretical frameworks in a new research setting and reflect on them from a novel perspective. I believe the particular advantage of studying this type of a diffusion pattern is in that largely the same innovation was initially turned down by the same individuals who then later adopted it due to a specific change in the context. As the other two factors (adopters and innovation) were not directly influenced by the pandemic – but only indirectly due to context change – the research setting allows for a clearer analysis of the influence context has on the diffusion process. That is, the part context plays in the interaction between the innovation, adopters and context. As well as how context determines which theoretical mechanism of diffusion is the most relevant in a given situation. The case of teleconsultations is particularly fitting for studying the interaction of the factors since these systemic integration requirements have been at the root of their non-adoption despite several facilitating factors (Standing et al. 2016).

1.2 Research questions and structure

This study was made to complement the findings from a prior so-called KEMUT-study I was part of (See Salonen et al. 2025). The KEMUT study was based on interviews with healthcare organization managers and other administrative level individuals. The general message regarding teleconsultations (TCs) was that the larger private healthcare organizations (which represent a large part of the private sector) had adopted TCs well before the pandemic, but physicians had been reluctant to provide them. The field appeared to be struggling to create and adopt innovations that increase efficiency so understanding the diffusion of innovations with such potential like TCs felt important. The KEMUT study lacked the perspective of physicians who had been noted as highly important actors in determining whether an innovation diffuses or does not. Thus, I focused on their perspective in this study, while using the KEMUT data to create a more comprehensive picture of what had happened.

The KEMUT study made me assume that physicians had been central in TC diffusion, but I did not have specific propositions as to why the diffusion pattern had been such as it had. Rather I approached the topic with open-minded curiosity. Hence, this thesis was explorative in nature. Before gathering data, I reviewed the literature on teleconsultations and innovation diffusion, so I might better understand my data and not miss out on things I might if I was not already familiar with them through theory and extant literature. It also allowed me to find the research gaps and hence tailor my interview questions and data analysis so that I would get answers for them as well.

Because my study is explorative, I chose to frame it around multiple research questions. Focusing on only one theoretical gap might have caused me to overlook insights that are valuable to both theory and practice. After all I did not know what type of data I would generate and what I might uncover from it if I kept an open mind. Yet, having found the gaps in the theoretical literature I could make sure my data included information about them as well and I knew to look for answers for them in the data. Eventually, I decided on two theory-based research questions, which I believe will also allow me to contribute to theory and inform practice. These are:

1. How did the characteristics of the system, the adopters, and the innovation together influence teleconsultations' diffusion in Finland?
2. How did the social and rational reasons[1] drive the diffusion of teleconsultation in Finland?

By answering the first question I believe I can contribute to the diffusion literature by illuminating how different factors interact, and by highlighting the importance of this interaction for the outcomes of the diffusion process. This is important because there is clear evidence that the interaction is important, yet most studies still focus on factors in isolation, and the interaction is inadequately understood (Cannavacciuolo 2023).

The second question is similarly important, because most diffusion studies tend to choose either a rational or social perspective, – Where innovation adoptions are based on either rational or social reasons/considerations, yet diffusion processes have varying amounts of both social and rational drivers (Ansari et al. 2010). When the underlying assumptions are too rigid the analysis of the results can suffer. Thus, better understanding how and why social and rational reasoning influences diffusion is essential.

For data gathering I decided to use semi-structured interviews and public data. I chose interviewees who had practiced medicine as physicians well before the pandemic and could hence tell of their experiences and attitudes regarding TCs both before and after the pandemic and what factors had influenced their attitudes and decisions to adopt or reject TCs in both time periods. From public data I chose the most prominent national healthcare related magazines/journals and reviewed all their articles with a mention of teleconsultations until 2025. This way I believed I could see how the general discussion and attitudes regarding TCs had changed from before the pandemic to after it. The main focus is from around 2019 to 2023 with the pandemic’s effects on Finnish healthcare starting in spring of 2020 and dying down in the following two years. Though there is no clear ending for the pandemic as the virus became endemic. My focus is mainly on the private sector.

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[1] Later on, I also use terms such as rational/social drivers and considerations, to refer to this same concept of diffusion happening due to rational/social reasons. The definitions for these terms were given in sub-chapter 1.1.

2 Literature review

In this chapter I first discuss innovation diffusion from two perspectives. In the "Why innovations diffuse" chapter I review the literature that seeks to uncover the motives that drive individuals to adopt or reject innovations. In the "Elements of diffusion" chapter I present the factors that have been found to influence the likelihood of innovation adoption the most. Through these two chapters I provide the basis for a comprehensive understanding of the innovation diffusion literature needed to understand this thesis. Then in the "Frameworks based on the literature" chapter I take one step further and try to bring light to the very specific areas my thesis contends with. First to the interaction of the various factors influencing the diffusion of innovations and then how those various factors may influence whether individuals are inclined to imitate others in their adoption decisions or make their own decision based on technical reasons. Lastly, I explain what teleconsultations are as a concept and their diffusion history in the healthcare field.

2.1 Why innovations diffuse

In the following three sub-chapters I discuss the diffusion literature that is focused on the types of reasons that are theorized to drive diffusion. In essence, the research perspectives on this issue can be divided into two categories: social and rational approaches. In the first sub-chapter I present the general discourse on the topic. In the second sub-chapter I show that the literature is still incomplete and its explanations regarding why adopters adopt when they adopt are still under contention. There I also lead the discussion to the third sub-chapter's topic of how users of the innovation and managers are influenced by different drivers of diffusion.

2.1.1 General mechanism of diffusion

Central to diffusion research is the well-known finding that the pace of diffusion tends to increase as more individuals adopt the innovation. This means that each new adopter facilitates subsequent adoptions. On a graph the pace of diffusion creates an S-shaped curve for successfully diffusing innovations when plotted over time. (Mansfield 1961; Rogers 2003.) Why this happens can be explained in two ways: via rational explanations or via social explanations. Or a combination of these two. (Kennedy & Fiss 2009; Ansari et al. 2010; Compagni et al. 2015.)

Rational accounts view that innovations are adopted for their technical features which lead to greater organizational or individual performance. The formation of the S-shaped curve of cumulative adopters is explained by 'informational cascades' where the information regarding the innovation’s utility increases and uncertainty decreases as more entities adopt the innovation. Thereby causing more adopters to realize it is beneficial for them to adopt the innovation. Alternatively, the phenomenon can be explained by ‘network externalities’ where a greater number of adopters increases the innovations utility to everyone (e.g., the telephone). Either mechanism leads to increased rate of adoption due to rational reasons. (Abrahamson & Rosenkopf 1993; Strang & Soule 1998; Roger 2003; Ansari et al. 2010; Naumovska et al. 2021.)

The logic of rational accounts is well supported by empirical evidence of more profitable innovations being adopted with greater probability and increased rate of adoption (Rogers 2003). Unfortunately, rational accounts have limitations in their ability to explain why organizations and individuals sometimes adopt innovations which do not provide them with improvements in efficiency and also reject innovations that would (Abrahamson 1991, 1996; Abrahamson & Rosenkopf 1997).

Fortuitously, social accounts complement this aspect well, as they argue the adoption of innovations is due to social pressures toward similarity. Meaning organizations adopt or reject innovations in order to look legitimate in the eyes of their stakeholders and not because of the innovation’s technical benefits. Thereby, social accounts provide further explanations as to why inefficient innovations sometimes diffuse successfully and efficient ones do not. (Meyer & Rowan 1977; DiMaggio & Powell 1983; Abrahamson 1991; Tolbert & Zucker 1996; Sturdy 2004; Hinings & Tolbert 2008.) Tolbert and Zucker (1996) argue that instead of supporting one view over the other, rational and social accounts present a continuum and which perspective should be emphasized to explain behaviour depends on the situation.

In accordance with this view Fad theories were established in the wake of a consistent empirical finding that the adoption of an innovation by early adopters was done because it solved a problem they had, but the same explanation did not hold for later adopters. Fad theories proposed this phenomenon was due to bandwagon pressures where the number of adopters causes the rest to follow suit instead of following their personal evaluation of its pros and cons. Meaning the first adopters rationally adopted the innovation based on their personal evaluation of its benefits, but then later actors adopted it either because of institutional or competitive pressures. (Abrahamson & Rosenkopf 1990, 1993.) Adopting due to institutional pressures means they did not wish to lose their legitimacy (Meyer & Rowan 1977) and due to competitive pressures, that they feared being left behind the competition more than they desired to reap benefits from not adopting the innovation (Abrahamson & Rosenkopf Bartner, 1990).

Some rational models (e.g., Banerjee 1992; Bikchandani et al. 1992, 1998) however argue that this type of herd behaviour – the result of which is called the bandwagon effect - can be rational if other actors are expected to be rational and therefore early adopters' adoption-decision implies the innovation has benefits they did not know of. A key feature is that they assume others to hold additional information that they themselves do not have (Lieberman & Asaba 2006). This is an evolution from the early neo-classical economic perspective (Rumelt et al. 1991). Similarly, there are social accounts which insist on entirely social reasons for all adoption behaviour so there are puritans on both ends of the spectrum (Ansari et al. 2010). An important distinction between rational and social models is that the bandwagons based on institutional pressures can become strongly sedimented and stable (Tolbert & Zucker 1996) whereas rational bandwagons can change direction from adoption to abandonment quickly if new information is introduced (Bikchandani et al. 1992; Greve 2011).

Rogers' Diffusion of innovations (DOI) theory is an example of a rational model that acknowledges social influences. It holds a rational account perspective by assuming the innovation-decision process is mainly about uncertainty reduction which happens as the system has an increasing amount of adopters that can spread information about the benefits of the innovation. Thereby the diffusion rate's increase is explained by informational cascades. Yet, mere mass media spread information is not considered enough to generally persuade a person to adopt an innovation and instead peer influence is critical for diffusion. Additionally in DOI the relative advantage of an innovation can be a social benefit. (Rogers 2003.)

In sum, increases in the number of prior adopters influences positively later diffusion. This creates the well-known S-shaped curve of cumulative adoption which can be explained by both social as well as rational reasons. Rational accounts do not necessarily claim social influences have no impact on the diffusion, but simply that the adoption of the innovation was made thinking that the innovation will benefit them due to its superior technical features. Whereas social accounts assume individuals adopt innovations simply because the act of adopting it rather than using it, will bring them social benefits. Some researchers opt for a middle course where both explanations are acknowledged while others are more puritan in their approach. The literature also seemed to indicate that the relative time of adoption correlates with the adopters' degree of rationality as also argued for example by Tolbert and Zucker (1983) and evidenced by Westphal et al. (1997). This as mentioned is a somewhat questionable claim and brings us to the discussion of how diffusion drivers vary between adopters. We will explore this next.

2.1.2 Reasons to adopt an innovation vary between adopters

While the above discussion led us to consider that early adopters adopt for rational/technical reasons and later adopters for irrational/social reasons, this might not be entirely correct, and it has a couple of problems. First, with this assumption it is difficult to explain what drives early adoption of innovations when there is no good data to diminish uncertainty about the innovation's benefits and social pressure has yet to build up (Compagni et al. 2015). Second, social and rational motivations are very difficult to separate from each other and can coexist (Lounsbury 2007).

After Kennedy and Fiss (2009) re-analysed Westphal et al.'s (1997) dataset they concluded that both early and late adopters can be simultaneously incentivised by both social and rational drivers. They argue that the dividing element is in that early adopters are driven more by the *opportunity* presented by adoption whereas for later adopters the *threat* of losses weighs more heavily in the adoption-decision process. Though later adopters do seek gains as well. Notable is also, that the variance they found between early and late adopters' motivations was not particularly large, thus leading them to suggest that adoption timing might not be as significant of a predictor of adoption motivations as generally thought. Which was priorly suggested by Kraatz and Zajac (1996).

Compagni et al. (2015) had similar results in their study of robotic surgeries noting that later adopters were affected more by fear of social/economic losses and the actors that drove early diffusion were peripheral actors who saw an opportunity to rise in status by being an exemplary user of the innovation. Though they noted that the earliest adopters were a mixed group consisting of both central and peripheral actors, with the former adopting it for more defensive reasons and the latter for a chance to climb in status.

A major difference between these two adopter groups from a diffusion standpoint was in that the peripheral actors pushed the innovation publicly by giving glorifying accounts and sharing their implementation/use methods even though the innovation's benefits were questionable. This led to continued diffusion as then later on the priorly mentioned rational and social drivers of diffusion picked up steam.

These results are interesting in three ways. First it touches an area of contention in the diffusion literature regarding adopter characteristics. Specifically, the question of how success is correlated with innovativeness. Larger organizations are generally perceived to be slower to change (Tushman & O'Reilly 1996; Carrilo & Gromb 2006) yet size (of organizations) and wealth (of individuals and organizations) are often considered the best (even if likely indirect) indicators of innovativeness

(Rogers 2003). Though some studies do not find them the best indicators despite being the most commonly used (e.g., Jeyaraj et al. 2006).

Second, diffusion research has typically noted the important facilitators of early diffusion of innovation to have been opinion leaders and champions who are high status individuals (Rogers 2003; Ferlie et al. 2005; Hendy & Barlow 2012) but here the importance of peripheral actors became emphasized. Third, Compagni et al. (2015) found possible mechanisms for how diffusion was affected by implementation/use and not just by adoption which most extant literature has studied (Greve 2011). This last one is of particular interest in this thesis as the use of teleconsultation spread during the pandemic and not simply organizational adoption of it.

2.1.3 User and adopter bandwagons

Since the information by which adoption decisions are made is limited, adopters try to learn from the behavior of those around them (Mansfield 1961; Greve 2011). When someone adopts an innovation, it means they have made a positive evaluation of the innovation which is seen to increase the likelihood that the innovation is beneficial (Banerjee 1992; Bikchandani 1992). However, innovations sometimes have heterogenous value which means they are beneficial to some adopters but not to all (Greve 2011). Which is why the bandwagon effect – meaning individuals adopted an innovation because others adopted rather than for technical reasons they themselves perceived the innovation to have – is stronger when the adoptions have been done recently by actors similar to the focal unit (Greve 1998; Lanzolla & Suarez 2012). Though central higher status actors are often thought to be better at evaluating the innovation's value while also being more visible and thus, their adoption of an innovation has at times been noted to strengthen a bandwagon effect more (Banerjee 1992; Bikchandani et al. 1998; Rogers 2003).

Still, organizations and individuals have less information about the innovation when making their adoption decisions in comparison to when they actually have the innovation at hand. Thereby, post-adoption behavior, that is, how the innovation is used is considered higher value information than the knowledge that someone adopted the innovation. (Greve 2011.) This type of information can of course be harder to come by (Strang and Soule 1998) and organizations can purposefully try to control the information to influence the behavior of others (Greve 2011; Compagni et al. 2015). Greater proximity between a focal unit and an earlier adopter increases the salience of the innovation's utility in action and therefore leads to greater emphasis of usage information over adoption information (Greve 2011).

These considerations regarding what type of information is valued are particularly important when discussing contingent adoption decisions where the innovation must be adopted twice before it is actually used by the organization. First by the managers of the organization who decide to bring the innovation to the organization and then by the users who decide whether they will actually use it. This is also the case with teleconsultations. Organizational adoption of an innovation does not always lead to actual usage of the innovation. This is referred to as the adoption-use divide and is a well-documented issue (Wang 2009).

This adoption-use divide exists in part, because managers and users are to a degree influenced by different factors. Managers responsible of organizational adoption decisions are influenced more by whether other organizations have adopted the innovation – sometimes referred to as adopter bandwagons. Whereas users are more interested in the technical aspects of the innovation as well as by whether other users use the innovation. The latter reason is sometimes referred to as user bandwagons. (Lanzolla & Suarez 2012).

In healthcare the adoption-use divide might be pronounced because healthcare professionals have considerable say in what methods they use and can thus stop the implementation of innovations they do not want to use (Greenhalgh et al. 2017b; Ferlie et al. 2005). This might in part explain why the implementation attempts of telemedicine, including teleconsultations, have tended to fail prior to the pandemic (See chapter 2.4). Hence in healthcare it would be of increased importance that managers are aware of physicians' opinions regarding potential innovations.

2.2 Elements of diffusion

In the previous chapter I discussed the theorised reasons why innovations are adopted. For status related reasons or because the adopter believes better outcomes can be produced with the innovation. I also explained how these motivations can mix and how their importance may vary depending how early or late the adopter adopts relative to others. In the chapter I also discussed how these theories explain why the rate of diffusion follows a bell curve as the innovation spreads though a system. I also explained how managers and users may differ in their reasons to adopt an innovation which causes the adoption-use divide where organizations adopt an innovation, but do not actually use it.

In this Elements of diffusion chapter, I focus on the characteristics of the innovation and of the system that influence whether an innovation will diffuse successfully. The innovation characteristics are directly and mostly important for individual technical evaluations. The system characteristics are important for both technical and social reasons and greatly influence how strongly rational or social reasons drive the diffusion.

In the characteristics of the innovation chapter I do not list every single innovation characteristic that has been used in studies but rather focus on the ones with the most empirical support. I use Rogers' five to frame the chapter because 1) they have lots of support behind them and 2) I can discuss the other prominent innovation characteristics alongside them and show how they are related.

In the system and its members chapter I explain how system characteristics influence both how easy it is for innovations to diffuse in a given system and how they influence whether social or rational considerations drive the diffusion. In light of this information, I discuss the characteristics of the field of health care.

2.2.1 The system and its members

Rogers (2003, 23) defines the social system within which adoption happens as "a set of interrelated units that are engaged in joint problem solving to accomplish a common goal". Thus, system is not defined by its size, but can refer to a group, a structure or the whole world if need be. For our purposes the system in this study refers to the Finland's field of health care. Which, following DiMaggio's and Powell's (1983) view includes all the stakeholders important for the continuance of everyday life in that sector. Meaning, not only the provider organizations and consumers, but also the regulatory agencies, suppliers and so on. The system can influence innovation diffusion considerably so it is important to understand it so its impact on the diffusion process can be taken into consideration (Rogers 2003, Greenhalgh et al. 2004).

Systems can also overlap, so that one actor can be part of multiple systems at once. In health care an example would be that a physician is part of her work system but is also influenced by the systems her children are part of. For an innovation to diffuse successfully it must align with these overlapping 'shadow systems' as well. (Plsek & Greenhalgh 2001.)

Health care is a complex field because of how the regulatory, policy, and financial components are interconnected (Khodadad-Saryazdi 2021) and this complexity is only growing (Plsek & Greenhalgh 2001). This is also what makes implementing telemedicine complex (Barlow et al. 2007; Barlow 2015). However, for telemedicine the complexity is particularly high as it is seen as a transformative innovation that requires a "paradigm shift" for how health care is provided that touches all organizational levels (Gagnon et al. 2005). Different stakeholders can have different interests and hence an innovation may have asymmetrical costs and benefits for different individuals (Denis et al. 2002). Hence, the more stakeholders need to adopt an innovation the less likely it is to diffuse. Because the more stakeholders there are, the more likely it is that the innovation creates asymmetrical benefits which are reasons to reject the innovation.

This obstacle would be mitigated if successful adoption by one group would lead to a bandwagon effect causing the other stakeholder groups to follow in suit. Groups are however separated by differences caused by different backgrounds and cultures due to which they trust different types of information and different sources of information. These differences hinder diffusion from one group to another. (Ferlie et al. 2005.) Groups can also be influenced by different types of bandwagons. For example, users are influenced more by user bandwagons rather than organizational adoption bandwagons and vice versa, though they do have an effect on each other (Greve 2011; Lanzolla & Suares 2012).

Different groups also have varying amounts of power regarding adoption decisions. The influence physicians have on administrative decisions is a lot greater than operational users do in many other fields and can stop the implementation of an innovation (Ferlie et al. 2005; Greenhalgh et al. 2017a, 2017b). Additionally, physicians are such a coveted resource that health care organizations have been known to adopt innovations simply to please and attract more physicians (Dranove & Satterthwaite 2000). Hence, physicians have a particularly large impact on whether health care organizations adopt or reject innovations.

Fitzgerald et al. (2002) listed the most important factors determining the outcome of a physician's adoption-decision as 1) what are the adverse effects for the patient if the innovation is not used, and how well it can be applied to multiple patients; 2) financial considerations; 3) Peer opinion; and 4) Patient feedback.

Healthcare is a field where peer opinion is of particularly high importance relative to other fields since it's known to have strong group pressures (O'Connor & Scott 2019). Hence, bandwagon effects are common in healthcare, both in organizational level (Kaissi & Begun 2008) and in individual level (O'Connor & Scott 2019). This may in part be, because the education style of medical schools causes pressures toward conformity (Beran 2015). For physicians these pressures mainly come from other physicians while managerial opinion is not as important (Adler & Kwon 2013).

The influence of peer opinion varies depending on how the influencing peer is seen. Of particular importance are specific individuals who hold prestige and thus have great influence over the opinions of others. These are called opinion leaders. If they decide to start promoting a specific innovation they are referred to as champions of the innovation. (Rogers 2003.) In healthcare champions have been considered to have a particularly important role for innovation diffusion (Strang & Soule 1998; Rogers 2003). Yet, their importance diminishes in heterogenous systems with multiple group boundaries (Ferlie et al. 2005) and can even become obstacles in such systems (Hendy & Barlow 2012).

Social explanations of innovation diffusion would hence appear likely to hold high explanatory power in the healthcare field, as peer opinion is held in such high importance. Healthcare organizations have also been argued to not adopt innovations only for efficiency related reasons, but also for symbolic reasons (Prasad & Prasad 1994) and reputational reasons (Compagni et al. 2015). Which fit with social account perspectives. Yet, while physicians value peer opinions, they also place great emphasis on their own individual opinions (Adler & Kwon 2013), which aligns with rational perspective.

Individuals may also vary based on their innate propensity to adopt innovations. According to Rogers' (2003), definitions innovative individuals are those who adopt innovations the earliest. This has garnered some critique, as it is not a true abstract definition and hence cannot be used to predict individuals' behaviour or to compare findings (Midgley & Dowling 1978; Flynn & Goldsmith 1993). Hurt et al.'s (1977) definition of innovativeness as "willingness to change" was in that sense better. Yet, these general definitions did not possess strong predictive power in specific scenarios (Goldsmith and Hofacker 1991; Leonard-Barton and Deschamps 1988) and hence, domain specific innovativeness definitions were argued for (Flynn and Goldsmith 1993). Agarwal & Prasad (1998, 206) hence defined PIIT (Personal innovativeness in the domain of information technology) as "the willingness of an individual to try out any new information technology". The individuals' level of PIIT influences how they perceive new information technologies and how likely they are to adopt and use them.

In sum, important system factors influencing innovation diffusion are the number of stakeholders in it; the strength of social boundaries between them; how well their interests, values, needs, and shadow systems align in regard to the innovation; how innovative they are; are there strong opinion leaders or champions supporting the innovation; which groups have power regarding the innovations diffusion and how much power do they have; what is the culture like. Healthcare has many central stakeholders with strong social boundaries and conflicting interests. Opinion leaders are important, managers less so relative to other fields. Social norms are strong, but physicians also place great value on their own individual opinions.

2.2.2 Characteristics of the innovation

Rogers (2003, 12) defines innovation as an idea, object, or practice which was previously unknown to the adopter, or they had not formed an opinion about it yet. Therefore, the definition of innovation is dependent on the perspective of the adopter and not on objective novelty. While early research focused greatly on the channels by which innovations spread (Strang & Soule 1998) and then on the traits of the adopters, Rogers (2003) notes that the perceived attributes of the innovation are what affect its rate of adoption the most out of the four main elements: innovation characteristics, system characteristics, communication channels, and adopter characteristics. Explaining between 49 and 87 % of the variance in the innovation's rate of adoption.

There are several models of innovation characteristics to explain innovation adoptions. Currently the most cited theory in general is the Unified Theory of Acceptance and Use of Technology (UTAUT2), and it is also commonly used in the health care context (Baudier et al. 2023). However, it is specifically for user acceptance and use of innovation, not organizational adoptions. Rogers' theory is the only model that considers both individual and organizational adoptions (Jeyaraj 2006). Since teleconsultations first require an organizational adoption and then individual adoption to be used, I emphasize Rogers' model here but also acknowledge central constructs from other models.

According to Rogers' (2003) review, five attributes explain practically all the effects an innovation's characteristics has on its rate of adoption. These are: Relative advantage, Compatibility, Complexity, Trialability, and Observability. Out of these five he considered the first two to be the most important for rate of adoption. The first three are also in the top five of most commonly used independent factors to study organizational IT adoption (Jeyaraj et al. 2006).

In early diffusion research the innovation was thought to be adopted 'as it is' by everyone, but later researchers began to note that adopters often adapted the innovation to their needs. Thus, an important feature of an innovation is that it is moldable to fit the adopter and the attribute Re-invention was added to the list. (Rogers 2003.) Though it is often not included in the frameworks of studies using Rogers' model (Jeyaraj et al. 2006).

Greenhalgh et al. (2004) reviewed the evidence on each of the features and found strong evidence for each of their effects. However, they concluded that to better explain the diffusion of health service innovations the list of key attributes should be complemented with: Fuzzy Boundaries, Risk, Task issues, Knowledge Required to Use It, Augmentation/Support. Even though the evidence they found was not as strong for these additional characteristics. They also noted that none of the innovation characteristics predicted adoption in all settings. Kapoor et al. (2014) found in their meta-analysis that relative advantage, compatibility, and complexity had statistically significant correlation with adoption, while trialability and observability did not. In contrast Jeyaraj et al. (2006) found all of them to have significant prediction power regarding IT adoption at least in half of the studies they reviewed. Thus, there are considerable differences between Rogers' innovation attributes' predictive power in regard to the rate of adoption.

The innovation characteristic that is related to benefits to adopter in Rogers' model is referred to via the concept of relative advantage. While the UTAUT2 model uses the concept of Performance Expectancy (Baudier 2023). In TAM relative advantage is referred to as perceived usefulness (Agarwal & Prasad 1998). In this thesis I use the term relative advantage. It is slightly broader as a concept than Performance expectancy which focuses specifically on expected benefits for job performance (Venkatesh et al. 2003).

Relative advantage refers to the degree by which the innovation is considered superior to what it is meant to replace. It is a subjective perception, which is formed in the discourse during the innovation-decision process. Sub-categories of the relative advantage include economic benefits, social status, lesser time-consumption and effort among others. The higher the relative advantage is evaluated to be, the faster the rate of adoption. While relative advantage by itself does not necessarily lead to widespread adoption, without it, diffusion is highly unlikely. (Rogers 2003; Greenhalgh et al. 2004.)

Notable is also that the relative advantage of some innovations increase as they diffuse further, due to networking benefits, later improvements, and adopters' improved skills at its application. This ultimate disposition or technology's destiny is however very difficult to predict early in the adoption phase. Therefore, the impact of innovation destiny on the rate of adoption is limited but has greater effect on the sustainability of the innovation's adoption. (Fichman 2004.)

Relative advantage is also dependent on contextual and individual factors. For example, the elderly were especially vulnerable to the Covid-19 virus and therefore the relative advantage of telemedicine was pronounced for them (Saleem et al. 2020). Whereas a major problem for TC in comparison to traditional physician consultations has been its problems with cost-efficiencies due to lack of reimbursement (Campion et al. 2016; Goenka et al. 2020; Khodadad-Saryazdi 2021).

Relative advantages can differ between adopters as well, particularly between stakeholders (Denis et al. 2002). Thus, causing the aforementioned adoption-use divide. Performance expectancy has also been found to be among the most important factors to influence health care professionals' intention to adopt health information systems (Owusu Kwateng et al. 2019).

Compatibility is high when the innovation aligns with the adopters' needs, values, norms, and past experiences. The better the alignment the easier the adoption process should be, and thus the faster the diffusion. (Rogers 2003; Greenhalgh et al. 2004.) Denis et al. (2002) provides strong evidence for the importance of compatibility in innovation diffusion in healthcare. Particularly regarding complex innovations and adopter needs. Arguing that without adequate compatibility high relative advantage is not enough for the diffusion of complex health care innovations. Which telemedicine, including teleconsultations are from organizational perspective (Barlow et al. 2006). Compatibility does not have direct counterparts in TAM or UTAUT2.

Complexity refers to the usability and understandability of the innovation (Rogers 2003). In TAM this is referred to invertly via ease of use (Agarwal & Prasad 1998). Lower complexity leads to faster adoption, but how complex an innovation is perceived depends on the adopter. The negative effect of complexity can be decreased with training. (Rogers 2003; Greenhalgh et al. 2004.) Which is why the guidelines for telehealth implementation emphasized the importance of patients' as well as health care staff's know-how (Goenka et al. 2020).

Many studies have also used UTAUT2's Effort Expectancy (EE) concept which refers to how easy to use users feel an innovation is. It is constructed from complexity, perceived ease of use and ease of use (Ventakesh et al. 2003.) and has been noted to significantly influence users' behavioural intention to use medical technologies (Baudier et al. 2023; Sari et al. 2018). Particularly so during the pandemic (Napitupulu et al. (2021). Though contradicting evidence also exists (Francis 2019; Baudier et al. 2020).

Teleconsultation is not particularly complex to use (Baudier et al. 2023), but implementing it is, because it interacts with such a wide variety of stakeholders (Khodadad-Saryazdi 2021). The asymmetry in risk and benefits among stakeholders has been a major barrier to diffusion (Barlow 2015).

Trialability refers to how easily the innovation can be experimented with, prior to full-scale implementation. The adoption of teleconsulting by healthcare professionals requires the organization to implement it first, thus making it a so-called contingent-adoption decision. (Rogers

2003.) Thus, in this sense, the trialability of teleconsulting has two layers. First is how easy it is for the organization to implement with in small-scale, and then how easy it is for the individual to try it out after.

Observability. An important aspect in evaluating the utility of an innovation before the focal unit's adoption is by considering how well the innovation has worked for others. The ability to do this is dependent on the salience of the others operational results and thus observability has a strong influence on the adoption-decision and diffusion process. (Strang & Soule 1998; Rogers 2003; Greve 2011.) Generally better observability is seen to facilitate diffusion as it decreases uncertainty (Rogers 2003), but in case of a poor innovation observability may limit diffusion (Greve 2011).

Reinvention. The way innovations are implemented and utilized in different organizations varies, which leads to heterogenous results (Dokko & Gaba 2012; Compagni et al. 2015). Still, as reinvention was outside the frameworks of diffusion scholars it was omitted for a long time (Rogers 2003). Many studies referencing the DOI innovation attributes continue to ignore re-invention (Jeyaraj et al. 2006) and despite its relevance innovation adaptation has also been rare in management literature (Ansari et al. 2010). Khodadad-Saryazdi (2021) argues adapting telemedicine technologies to the organization instead of simply taking them as is, is a must, but not enough, as the organization should also adapt itself to be receptive of the innovation. According to institutional theory re-invention should happen more among early than late adopters (Tolbert & Zucker 1996).

These six factors form the basis for evaluating an innovation's likelihood of successful diffusion in a random social system. With information about the social system and the potential adopters of the innovation all the necessary factors for understanding the innovation's diffusion are present. Yet, it is the interaction of all these factors that make diffusion processes so complex. Let us next turn to that topic.

2.3 Frameworks based on the literature

I hope the two prior chapters created a good base through which the reader can understand diffusion of innovations. Yet, two aspects that are the most central for this thesis have yet to be thoroughly discussed. That is, 1) how do the previously mentioned elements interact in the diffusion process. 2) How do the elements influence whether the adopters' adoption decision-making is mainly individualistic or imitative and rational or social.

The literature is scarce regarding these issues. Particularly the latter one. Hence, in this section I have integrated the literature in a way others before me have not. Thus, the frameworks created based on this are more propositional than purely evidence based. Yet, these are the frameworks I wish to complement with my own data in the results section.

2.3.1 Interaction of the elements of diffusion

The review thus far in this Elements of diffusion chapter has shown how the rate of diffusion is generally discussed in the literature. That there are various factors that facilitate or negate the diffusion of an innovation. The framework thus, looks something like presented in figure 1. As I include communication channels within system characteristics here.

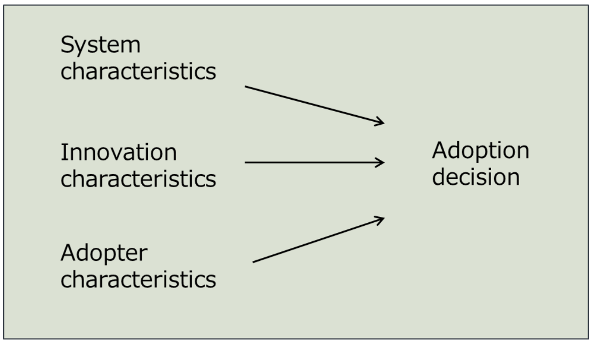

Figure 1: Simple model of innovation adoption

Yet, an ever-growing number of studies argue that what is important in determining whether an innovation diffuses or not is the interaction between the people (adopters), the context (system), and the innovation (e.g., Wejnert 2002; Fitzgerald 2002; Greenhalgh et al. 2004, 2016, 2017a, 2017b; Khodadad-Saryazdi 2021). Understanding this interaction is considered important for both specifically telehealth innovations (Standing et al. 2018) as well as for innovation implementations in healthcare in general (Hendy et al. 2012). Despite large accumulation of evidence supporting the importance of focusing on the interaction of these factors, very few studies have focused on it. Almost all still study the factors separately even if they do claim a holistic perspective (Cannavacciuolo 2023). In healthcare one obstacle has been noted to be the too great emphasis on randomised controlled trials (RCT) which are not fit for understanding this dynamic interaction (Kessler & Glassgow 2011; Hendy et al. 2012; Greenahlgh et al. 2016).

These arguments support Actor-network theory's assumption that individuals have different meanings for the same innovation, (Denis et al. 2002) and for an innovation to diffuse members of the system must accept evidence of the innovation's benefits. Fitzgerald et al. (2002) argue this acceptance happens only after a period of local debate where the validity of evidence is negotiated and interpreted. How the characteristics of the system, the adopter and the individual discussed in the two previous chapters align is essential for the result of this process. The adoption decision process might thus be better visualised as in figure 2.

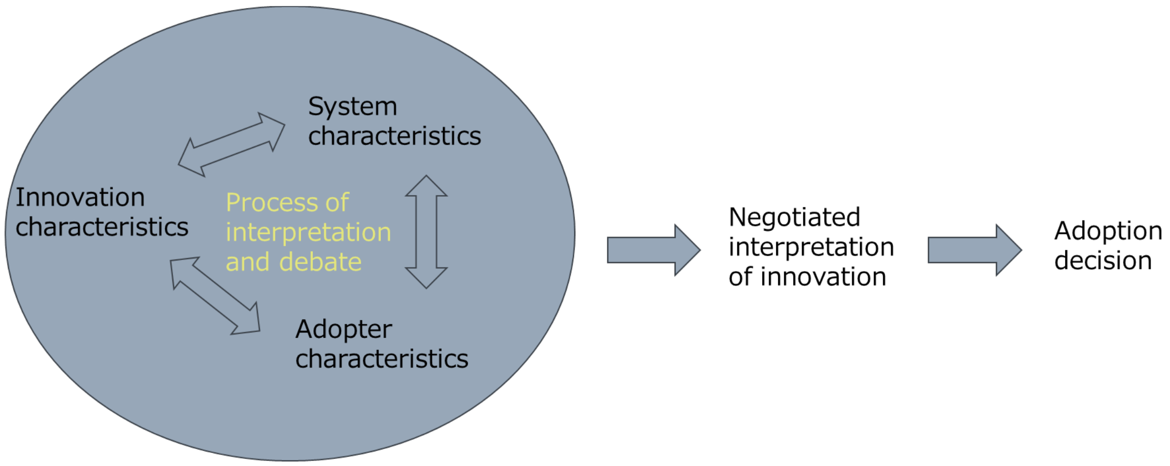

Figure 2: Interactive model of innovation adoption

As abandonments of innovation happen after adoptions the interpretation of the innovation does not really ever stop. The innovation is also often adapted to the system and to the users' preferences after adoption (Naumovska et al. 2021) thereby continuing the process. It is also important to take note, that different individuals make different interpretations of the innovation, so while the figure shows there exists a debate where the innovation is interpreted, not everyone reaches the same conclusion. Personal innovativeness is one adopter characteristic that influences individuals' perceptions of the innovation's characteristics of perceived usefulness (observable relative advantage), ease of use (complexity), and compatibility. Hence, innovative individuals do not require those innovation characteristics to be as high for them to adopt as individuals with lower innovativeness require. Innovativeness is particularly important for early adoptions of innovations. (Agarwal & Prasad 1998.)

2.3.2 Integrating the elements of diffusion with theories of why innovations diffuse

For a more comprehensive picture of diffusion, I think these literature streams regarding the elements of diffusion and the "Why" of diffusion should be integrated. Alas, generally, these literature streams do not meet. Hence, in this thesis I try to contribute to the diffusion literature in part by bringing them together. Some connections can however be made with the extant literature already. For example, Gibbons (2004) noted that central for diffusion is how network structures and the observability of innovations' benefits interact. Yet, innovations may hold asymmetrical benefits and hold different meanings to different adopters. Thus, politics, values and beliefs are important determinants of diffusion. (Denis et al. 2001.)

DiMaggio and Powell (1983) argue that the more ambiguous the information regarding an innovation is, the greater is the importance of subjective information from colleagues and other contacts. Banerjee (1992) and Bikchandani (1992, 1998) also noted that when the individual assumes others know something he/she does not it is rational to follow the behaviour of others. Yet, since the others may communicate biased information, the end result is likely more determined by political considerations if the benefits of the innovation are opaque than if they are salient. From these considerations we can make the following deductions shown in figure 3.

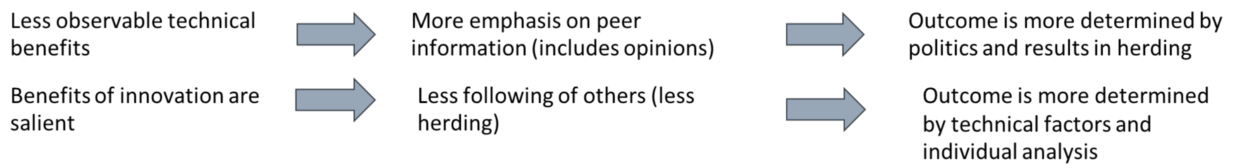

Figure 3: Salience of benefits influences herding behaviour and the extent of focus on technical factors

So, even though imitation may be rational, I propose it still leads to an outcome where non-technical factors have played a greater role than in a scenario with less imitation. Hence, innovation characteristics do influence the likelihood of herding behaviour.

In systems with strong pressures toward conformity imitative behaviour is common (O'Connor & Scott 2019). Whereas the individual characteristic of innovativeness has been linked to individual adoption decision-making (San Martin & Herrero 2012) and less experienced consumers have been noted to imitate others more (Chen et al. 2011). Self-efficacy has mixed results, with Argyris and Xu (2016) finding lower self-efficacy to correlate with more imitative behaviour. But then Darban and Polites (2020) did not find self-efficacy to reduce imitative behaviour but increase it instead under conditions of uncertainty regarding the innovation.

Figure 4 shows the characteristics that might influence whether decision-making is individualistic or imitative.

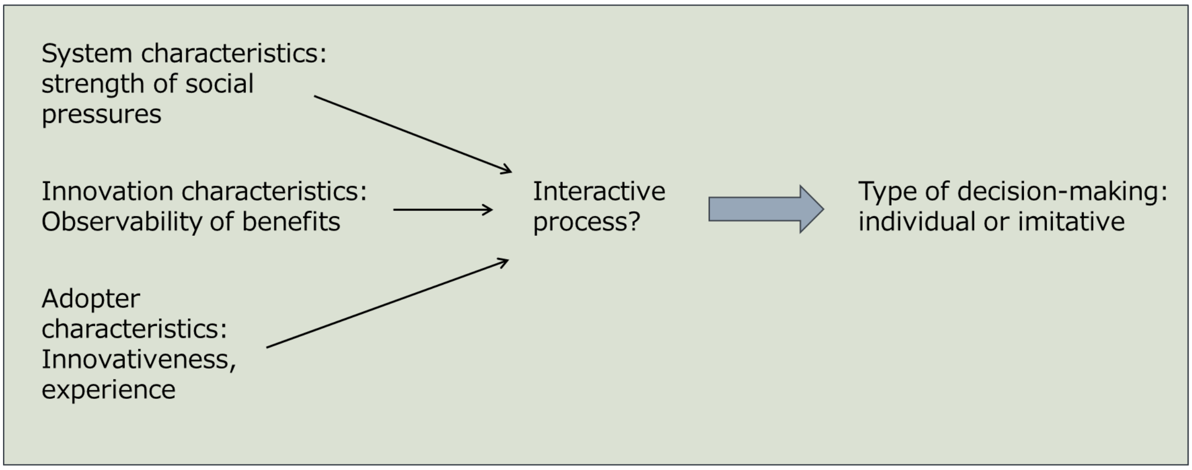

Figure 4: Determinants of the type of adoption decision-making

So herding behaviour is influenced by innovation, adopter and system characteristics. Whether the reasons of adoption are rational or social are likely also influenced by these factors, but there is hardly any literature that directly looks at this.

The literature that discusses social and rational drivers focuses on when are social and when are rational drivers in effect in the same diffusion process. I am interested in how the setting including actors and the type of the innovation influences whether the diffusion is driven more by social or rational considerations. I think this might yield interesting results since it has not been studied much and because we have already made the finding that sometimes diffusion processes are rational and at other times not so much. Denis et al. (2002) noted that politics is a great reason why the process is sometimes irrational. That is practically the same as social considerations, since adopting due to social considerations means the expected benefits are from adopting the innovation and not from its technical benefits. Which always happens when choosing a technically inferior option due to political reasons. Denis (2002) explains this politicking happens largely due to asymmetrical benefits, which are more common in complex systems. Particularly when adopting an innovation that influences many parts of that complex system. So, the complexity of the system as well as the scale of the innovation should increase the likelihood that social factors influence the diffusion process.

Largely these political considerations gain foothold because the benefits of the innovation are ambiguous enough to be interpreted as the individual desires. So, the observability of innovation's benefits is also important here. Figure 5 shows the characteristics that might influence whether the adoption decision-making is based on social or rational considerations.

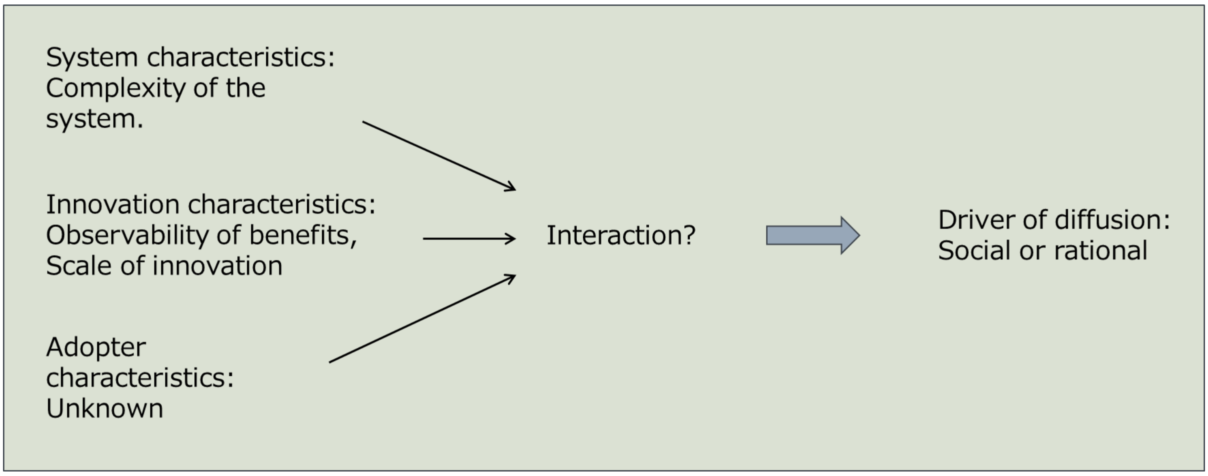

Figure 5: Determinants of the driver of diffusion

I believe it is very likely that strength of social pressures and innovativeness and experience influence the driver of diffusion in the same manner as they do the type of decision-making process. That is, those that facilitate imitative behaviour also facilitates social bandwagoning and vice versa. The literature is not however clear on that, so they are not included in the figure 5.

2.4 Teleconsultations

In this chapter I first define the focal innovation of this thesis, namely teleconsultations and place the term among the greater terminology related to telemedicines which it is part of. Then I discuss teleconsultations as an emerging technology and recount some of their diffusion journey in the world thus far.

2.4.1 Defining teleconsultations

The literature on remote care is somewhat confusing as it includes several terms such as Telehealth, Telecare, Telemedicine, e-health, m-health and so on. The oldest of these is telemedicine which was first coined in 1969 to refer to medical care without the patient and provider meeting face to face. However, as telecommunications proliferated more terms were added and telehealth came next in 1978 to include a broader array of remote medical activities such as education. (Bashsur et al. 2011.) Together with the progress in telecommunications these terms also continued to evolve with telemedicine accumulating over a hundred heterogenous definitions, which branched around a simple definition of the provision of health care at a distance (Sood et al. 2007).

The literature has become even more ambiguous as telehealth and telemedicine are often used interchangeably (Greenhalgh et al. 2017a, 2017b; WHO 2021, 2022) and while some argue these terms should be conceptualised as inclusive of each other so that telehealth is a subset of e-health and telemedicine is a subset of telehealth (e.g., Sood et al. 2007). Others argue it is better to separate them and treat them analogous to public health's relation to the practice of medicine, with telemedicine representing the latter (e.g., Bashsur et al. 2011).

These ambiguities in terminology are also still present in the literature today (Cannavacciuolo et al. 2023). This is problematic as some telehealth/-medicine technologies are more complex and interact with a wider set of stakeholders than others (Barlow et al. 2006) which makes their implementation projects less likely to succeed (Greenhalgh et al. 2017a).

When a wider set of technologies are lumped together or discussed interchangeably under the umbrella terms of telehealth and telemedicine it becomes difficult to distinguish which features of a telemedicine technology actually cause resistance or problems for adoption. Bashsur et al. (2011) even argue that this ambiguity is the central reason as to why the empirical findings on the benefits of TM are mixed, despite high theoretical benefits.

In order to bring salience and order to the chaos of telemedicine's terminology Bashsur et al. (2011) formed a taxonomy of telemedicine where telemedicine concepts are generally comprised of the three dimensions of functionality, application, and technology. More distinct conceptualizations are then formed based on the subcategories of these three dimensions.

1. Functionality refers to the processes of medical care, which they group into consultation, diagnosis, monitoring, and mentoring.

2. Application refers to the medical field or specialty (e.g., telepsychiatry), disease, site of care or the treatment around which the TM application or program is developed for.

3. The Technology dimension consists of synchronicity (interaction in real time or not), network design, and connectivity (wired or wireless).

Based on Khodadad-Saryazdi's (2021) interpretation of Bashsur's taxonomy the subcategory of telemedicine this thesis is focused on is called Teleconsultation where the functionality dimension includes consultation and diagnosis; application is not limited; and the care interaction happens in real time i.e. is synchronous. Notable is however, that many do not follow this taxonomy and for example Flodgren's (2015) term interactive telemedicine would apply to the technologies I study as well. Possibly even better in some aspects as unlike Bashsur et al.'s (2011) definition of consultation Flodgren (2015) does not include provider-to-provider meetings in theirs as I do not.

However, I believe teleconsulting to be a more accurate term in general as provider-to-provider meetings are often included as part of telemedicine (e.g., WHO 2021). Due to the overlap and inconsistencies of telemedicine definitions I do not limit this literature review only to articles using the term teleconsulting but focus on what technologies the given study actually discusses regardless of the terminology they use.

A particular problem in the literature in my opinion is that telemonitoring (also referred to as telecare (e.g., Hendy et al (2012)) is a more complex innovation than teleconsulting (Barlow et al. 2006), but it is still considered a part of telehealth. Studies (e.g., Greenhalgh 2017a, 2017b) often do not separate them when discussing the barriers and benefits of telehealth or -medicine even when they point them out as different concepts. Hence, it is difficult to tell which telemedicine diffusion/adoption research findings are the most relevant for a specific telemedicine technology.

Of course, telemonitoring and -consulting share certain benefits as they both are remote technologies, but I feel noting this habit of lumping them together in reviews is still an important notion to keep in mind when reading the extant literature. Similar notion is that some studies also use the term teleconsulting without explicitly defining it (e.g., Baudier et al. 2023), which is the same for many articles which study telemedicine (Sood et al. 2007).

However, besides sharing benefits they also possess synergetic effects. For example, being able to avoid the cost of travelling to a physician for consultation is not as useful if the patient has to go to the health center for monitoring regardless.

2.4.2 Teleconsultation as an emerging technology

A digital transformation is occurring in the field of healthcare (Kraus et al. 2021) as one important part of the solution to make healthcare more cost-effective (Agarwal et al. 2010). Digital transformation is "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies" (Vial 2019, 118). Teleconsultation as telemedicine and e-health in general is part of this transformation as an emerging technology focused around the patient (Baudier et al. 2023).

Teleconsultation is perceived to have a myriad of benefits. A fundamental aspect of TC is that it removes the need for transportation, thus improving access especially in rural areas and equalising health care access (Nesbitt et al. 2005). Though Chang et al. (2021) found that the communication modality patients use correlates to an extent with their socio-economic status where more privileged individuals more often use video connection whereas more vulnerable demographics emphasized only audio. However, Davis et al. (2016) did not find differences of outcomes between telephone and video communication modalities, and instead the patients were satisfied with both.

Besides, and due to its removal of transportation costs teleconsultation holds many other expected benefits for patients as well such as reductions in costs, improved access, enhanced efficiency and quality of healthcare delivery, decrease in waiting times, and lowered risk of contagion (Sood et al. 2007; Baudier et al. 2020; Khodadad-Saryazdi 2021). The last of which became the main driver of TC utilization during the pandemic (Baudier et al. 2021).

The benefits of cost-efficiencies through telemedicine have been hypothesized for providers as well, as long as TM is implemented properly as a system (Charles 2000). However, these financial benefits, which are considered a must for sustained adoption have not been so easy to achieve as telemedicine for a long time did not have a proper reimbursement structure in place. Yet regardless of the deficiencies in reimbursement some health care providers made it work and with the evidence they created of TM's benefits TM diffusion was expected to take of rapidly before Covid-19 already. (Campion et al. 2016.)

However, as a contrary view TM was expected to face barriers to widescale adoption even with proper reimbursement due to trust, social, legal and clinical issues, adopter age, and concerns regarding privacy and safety (Campion et al. 2016; Baudier et al. 2023). Thus, even in a study where high levels of satisfaction upon testing the innovation were reported by both physicians and patients, some health care professionals and patients still avoided using telemedicine (Nesbitt et al. 2000). However, once Covid-19 hit the world it influenced the system of health care so that the benefits TM provided became more important (Bauder et al. 2021). Thus, TM including TC diffused fast and widely. Yet, certain patients and providers of health care were not as prepared or open to shifting to telemedicine and differences between populations still exist in the degrees of TM adoption today. (Chang et al. 2021; Agarwal et al. 2022; Cannavacciuolo et al. 2023.)

3 Research design

In this section I explain my research design. That is, how I sought to fulfil my research objectives by collecting data and analyzing it using my chosen method. The collection and analysis methods I chose were decided based on my methodological perspective and research goals as is imperative for valid research (Hirsjärvi et al. 2004, 114-115; Hart 2005, 235). To make the logic of my research design salient and show how my methodological perspective aligns with my research questions, I explain in this section *what* I did as well as *why* I chose each method and perspective.

I first explain how the idea and need for this study became apparent in a previous KEMUT study (Salonen et al. 2025) and remind the reader of the purpose of this study. Following the needs of my research objective and conditions of the topic I then clarify my methodological choices. What is, and why I chose: a qualitative approach of critical realism, a case study, semi-structured thematic interviews and public data search as data collection methods, and thematic analysis as my method of analyzing the data.

3.1 Methodology: The rationale for my research design and methodological choices

This thesis is part of, and continuation to a larger 'KEMUT' research project where the need for this study was realized. The KEMUT project[2] is a mixed method study focused on the competition in the Finnish private healthcare sector. Foci of the study include 1) what changed during the past 10 years, 2) how the Covid-19 pandemic influenced the system, and 3) how the competition may change in the future.

I was part of the qualitative research group. In interviews with 14 key stakeholders, the rise of remote consultations emerged as the most significant change in the past 10 years. This also happened during, and largely due to the pandemic as prior its diffusion had been slow. Our findings highlighted the need to study this case of teleconsultations' diffusion more closely, so we could improve our understanding of the diffusion and non-diffusion of potentially useful innovations in healthcare.

As I turned to the literature on innovation diffusion, I identified two research gaps. First, existing studies often examine the system, the adopter, and the innovation separately, without exploring how these factors influence one another in shaping diffusion. Second, there is limited understanding

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[2] The development of competitive advantage in the private health care sector (KEMUT) | University of Turku (utu.fi)

regarding what determines how strongly rational or social mechanisms drive adoption in a given case. Teleconsultations appeared to provide a promising setting to investigate these gaps, enabling me to contribute to theory and inform practice.

To answer these questions, I felt I needed to continue with a qualitative approach. The reason being it is considered particularly good for gaining a holistic and an in-depth understanding of a phenomenon and individuals' perceptions of it (Creswell 2003, 22; Hirsjärvi et al. 2004, 152; Khan 2019, 171). Additionally, the KEMUT-interviews had suggested that physicians had been central actors in deciding whether teleconsultations diffused. As is common with most healthcare innovations (e.g., Ferlie et al. 2005). Hence, I needed to hear their views to understand their perspective.

Interviews are excellent for this (Rowley 2012) and thus became my main data collection method. Since lived experiences are subjective, I needed an approach that accepts this subjectivity while still allowing for generalization in the form of theory-building. This led me to discover the philosophy of science referred to as Critical realism (CR), which has the promise to do both (Mingers 2015). It aligned with my prior research designs and guided my analysis and theorizing, as I will explain below.

3.2 Critical Realism

Critical realism (CR) perceives social reality as being constructed in social interaction but still acknowledges an external observable world and the existence of more stable 'intransitive' structures (Eriksson & Kovalainen 2016; Mingers 2015). This way it can enjoy the advantages associated with both positivist/empiricist and constructivist/interpretivist approaches while avoiding some of their central critiques. That is, it does not simplify the real world greatly and close its eyes from phenomena that cannot be observed as empiricism and positivism have been critiqued to do. Yet, by accepting the existence of a dimension of our social world that exists irrespective of our notions of it, CR allows us to evaluate the correctness and validity of our interpretations of the world. Critical realism is considered particularly fitting for practice-oriented research that seeks to provide solutions to societal problems (Mingers 2015; Vincent & O'Mahoney 2014, 2018.)

A key element of CR is that it does not simply report its results. Reasons for the results are looked for and explained through theory. This process is referred to as abduction. CR also includes another mechanism: Retroduction. Here the researcher deduces what the world in wider terms must be like for it to have caused these results to appear. These two processes are often done in tandem, and many perceive them as one process. (Vincent & O'Mahoney 2018.) In retroduction often unobservable entities are argued to exist based on observable findings (Sayer 2002, 107) and hence the researcher's role as an interpreter is emphasized (Frederiksen & Kringelbaum 2021). To improve the researcher's ability to realize these hidden entities triangulation through using multiple datasets is recommended (Wynn & Williams 2012, 803).

A simplistic example of abduction would be if my interviewees told me that they had known about teleconsultations pre-pandemic but had been too uncertain of its safety and practicality to try it. Then only through seeing it in use during the pandemic they learned it is functional and picked it up. I could now explain these findings through the rational perspective of information cascades overcoming uncertainty. But I would still be uncertain as to why the decision-making process followed the rational perspective in this scenario rather than social accounts' assumptions. To understand this, I would use retroduction to think backward to the wider context and what it must be like, to produce this as the emergent outcome. Here in particular the KEMUT dataset could be useful.

CR holds a stratified, multi-layered worldview that emphasizes the importance of interconnectedness and emergence (Vincent & O'Mahoney 2018). The layers of the world are defined into three domains based on their tangibility. The 'Real' world is the deepest level and consists of structures and mechanisms that produce the 'Actual'. This is the domain of all the events in the world that we can or cannot observe empirically. Those that we can observe belong to the 'Empirical' domain. With the critical realist approach to research, we can learn about the Actual and Real through studying the Empirical. (Mingers 2015.) This perspective allows a comprehensive understanding of the social world and avoids reductionism or oversimplification. (Vincent & O'Mahoney 2018.) Through identifying these domains and the iterative process that exists between them, CR researchers can understand and explain the studied case or phenomenon better. This method also allows for the local information to be generalized through theorizing (Frederiksen & Kringelbaum 2021) CR also does not demand any specific methods to be used and so allows the researcher to tailor the design to the problem at hand (O'Mahoney & Vincent 2014).

3.3 Case study

My research design of choice is a case study, particularly a critical realist case study. However, Critical realism does not have specific guidelines about how to conduct critical realist case studies. (Miller & Tsang 2010). Hence, I adapted methods from other approaches and fit them with CR philosophy. The literature, however, is somewhat ambiguous as to what a case study actually is and what counts as a 'case' (Khan 2019; Easton 2010). Turnbull et al. (2021) consider it has even become a problem that many studies simply call theirs a case study without justifying their choice or actually following case study methods. Inversely, it is also argued that there are studies which should likely be called case studies, but do not term themselves so (Stake 2005). Whether they should be called case studies or not depends on which definition of a case study one follows. In order to not increase the chaos of this stream of literature as well as to help the reader understand this thesis, I now shortly discuss what are case studies, which perspective I follow and why. Then I describe the process of conducting a case study.

3.3.1 The definition of a case study

Some (e.g., Stake 2005) believe that case studies are defined by their object of inquiry. In this view a study is a case study if it has a well-defined case with clear boundaries, purpose and a self. Regardless of the methods used to study the case. Yin (2014, 15) critiques this view as inadequate since he believes the method of inquiry should be included within the definition of a research method. Followingly, Yin (2014, 16-17) uses a twofold definition for case studies which includes both their scope and features. In his view the focus of a case study is on a present-day phenomenon that is generally difficult to separate from its context. Therefore, the case is studied thoroughly within its natural context using triangulation of data to cope with the excessive number of factors influencing the phenomenon. He also believes the data collection and analysis to benefit from having developed propositions from theory in advance.

The literature regarding case studies seems to be agreeable to this view in most part. Particularly in that case studies have a holistic approach whereby they take the natural context into consideration. They generally also use multiple sources of data to gain a more reliable understanding of the case. (See Stake 2005; Yin 2014; Creswell 2012; Kovalainen & Eriksson 2016; Khan 2019.) However, questions regarding theory use and what the results should be hold a little more disagreement.

For example, Kovalainen and Eriksson (2016) seem to emphasize a more interpretative approach where 'thick descriptions' of the case are developed. In this approach which Stake (2005) refers to as intrinsic case study the goal of the researcher is to understand the case and appreciate the multitude of interpretations that can be made of it. Yin (2014) considers explaining the underlying causal mechanisms as the most important goal of case studies and the thick descriptions are only the second most important contribution though much emphasized in the literature. Stake (2005) classifies thusly motivated research as instrumental case studies.

The role of theory is minor for descriptive case studies because the findings are inductively generated from data. They also do not need to contribute to theory. (Stake 2005; Kovalainen & Eriksson 2016.) Whereas for instrumental case studies theory guides data collection and analysis. The results are also integrated with literature to further theory. (Yin 2014.) This approach aligns with the critical realist approach the most, because both seek theoretically generalizable contributions. My research aims and subject also align well with Yin's (2014, 2) description of a situation for which a case study is the appropriate research design. That is, 1) I am trying to understand a phenomenon that is difficult if not impossible to validly separate from its context; 2) My focus is on 'how' and 'why' research questions; 3) I (the researcher) cannot control the studied phenomenon; 4) the phenomenon of study has occurred recently or is still ongoing.

Hence, my choices regarding research design including data collection and analysis were largely guided by instructions from the literature holding this instrumentalist perspective on case studies. Yet, while Yin's (2014) approach includes the analytical technique of abduction, it does not include retroduction which is an important part of the CR methodology. Additionally, in CR case studies the researcher does not form a proposition to be tested before data collection and analysis (Vincent & Wapshott 2014). However, Yin's approach aligns with critical realist perspective for the most parts (Vincent & Wapshott 2014) as it does with my specific case and research questions. Yin's method is also considered fitting for business research (Koskinen et al. 2005, 158). Thus, I build on top of this Yin's general 'instrumentalist' perspective using the CR literature in these two areas of testing and retroduction.

3.3.2 The case study method

Case studies as a research approach have received a considerable amount of critique for procedural sloppiness. This is perhaps partly because no standardized research design for case studies has been developed yet. Yin (2014) uses construct validity, internal validity, external validity, and reliability as the general measures for methodological quality. Each segment of his research process thus seeks to contribute to one or more of these measures.

For construct validity defining the case specifically and how it is studied is central. Internal validity is considered mainly in the analysis phase. External validity relies on the quality of the theoretical framework through which the data is analyzed and compared to. Here reliability does not refer to replicability, because cases all vary from each other. Instead, reliability means there are no errors or biases which have skewed the results. The method to minimize this is by following an established research protocol strictly and describing the research process clearly, so the reader can evaluate the study themselves. (Yin 2014, 46-49.)

3.3.3 Defining the case

My research questions along with the story of arriving to this topic and to the propositions I formulated hopefully already give a good idea of what case this study is about. To further distinguish the case from its context explicitly it is recommendable to define the time period the case is about (Yin 2014, 33). The main focus of my case is from a little before the pandemic's start in Finland, which is 2019, until my data collection, so until 2024. I include 2019 in the time boundary because it is vital to understand how TCs were perceived before the influence of the pandemic. My data collection went of course even further to understand the historical context better.

Notable is also that as my unit of analysis is the Finnish health care system it includes sub-units of analysis such as the organizations and clinicians within them. Hence this is an embedded case study. Additionally, it is also an unusual case study (Yin 2014, 53-56.) as the pandemic and the following behaviour in the health care sector was a clear deviation from the normal.

The interviewees for this study were physicians who provided teleconsultations. They were either pediatrics, general physicians, or occupational health physicians located in Finland. Each of them also had experience of the physician practice pre- and post-pandemic.

3.4 Data collection

I chose semi-structured interviews as my main data source and complemented them with a priorly gathered KEMUT interview data set as well as with public data. The focus of my data gathering was about the adoption-decision making process Finnish physicians had regarding teleconsultations. This method of triangulation by using multiple data sets is widely recommended for case studies (Stake 2005; Yin 2014; Eriksson & Kovalainen 2016).

3.4.1 Physician interview data

There is no clear-cut answer for how many interviews should be conducted for a qualitative study. The term itself is somewhat controversial as some believe that sample size does not even belong in the lexicon of qualitative research to begin with. Others find that it is functional for qualitative research focused on factual information. Generally speaking, the need for data volume largely depends on the type of information one seeks. (Eriksson & Kovalainen 2016, 89.) For example, some authors recommend between 30 and 50 interviews for ethnographic studies, but only six or more for studies focused on the core of experience like mine. Data needs for studies regarding theory building and identification of themes are also considered to be lower than for group comparisons or hypothesis tests for example. (Ryan & Bernard 2000.) Rowley's (2012, 263-264) advice for new researchers is to first aim for around 6 hours total time of interviewing, which consists between 6 and 12 sets of interviews. Then, if need be, to do more, though also exercise caution to not over collect and 'drown in data'.

In each of these views my information need would be on the lower end of the spectrum. Since I already had additional data, I set my initial goal to six one-hour long interviews and then collect more if need be. In the end I found these sufficient. My interviews could have been called semi-structured (e.g., Koskinen et al. 2005) or thematic (e.g., Eskola & Suoranta 1998) depending on peer preferences. I had an interview framework, which consisted of seven main questions. Each of them had sub-questions which were asked if need be. I formulated the framework based on the innovation diffusion literature discussed in chapter 2. To increase the reliability of my interview data I followed Brewerton & Millward's (2001, 78-79), Alshenqeeti's (2014) and Rowley's (2012, 265) advice on interviewing carefully.

The semi-structured style worked well. Not having to follow a set order of questions made the interview conversational and led to many of the interviewees opening up well. Still having the framework allowed me to stay focused on the key topic-areas better than if I had used an entirely non-structured style. As well as make the interviews more comparable with each other.

I started analyzing the interview data while collecting. This allowed me to adjust my 'probing' or additional questions in later interviews. Due to which, I was better able to expand on the findings I made in earlier interviews. It also allowed me to examine continuously if my interview data was saturating or I needed additional interviews. Unsurprisingly, the continuous adjustments of the interviews always allowed me to find more things and the data did not reach complete saturation. Yet, the six interviews in addition to other data were enough to provide interesting findings to further develop current literature, so I considered them to be enough.

3.4.2 The KEMUT data

In addition to the six physician interviews, I had data from an earlier study, the KEMUT study. The KEMUT data was gathered during 2022 from spring to winter and also analysed from its theoretical perspective during that time as well. We interviewed 14 key stakeholders in the field, including top managers in large and medium sized health care organizations and experts of the field from other stakeholder organizations.

The interviews were structured based on Poirier's (1990) diamond model as it provided a complete overview of the factors influencing industry competition. Riina Hiltunen who had designed the KEMUT study had also noted it as a good framework in a previous non-published study with similar objectives. She was also the one who formed the interview questions and was the main interviewee for the first four interviews. Meaning, she made sure all the necessary questions were asked. Besides Hiltunen and me, Hennamari Mikkola from Kela/SII was also present at times. During these I was mainly an observer but gained important lessons about conducting research interviews in practice. Particularly how strong internalization of the interview questions beforehand allowed flexibility in the order the interview questions were discussed. Thus, making the interviews more conversational and natural. Which allowed us to gather more relevant data.

My role changed as Hiltunen left for her maternity leave and I became the main interviewee. To ease the transition, we switched positions with Hiltunen in a couple interviews before she had to leave. After she left, I conducted the interviews at times alone and sometimes Hennamari Mikkola from Kela/SII was present and once Jouni Saari was present.

While these interviews did not have a primary focus on teleconsultations, they were still an important theme during the interviews. Hence, the KEMUT interviews provided useful information on the viewpoints of other important stakeholders in regard to teleconsultations. The KEMUT interviews also gave useful information on the contextual factors of the Finnish healthcare system. Hence, allowing me to interpret the changes regarding teleconsultation diffusion in the right context.

3.4.3 The public data

I used public data as a support for my interview data because they are considered particularly important for accessing the details of complex phenomena, such as social processes. (Koskinen et al. 2005, 130-131.) As with all data, I held a critical opinion on their reliability, taking note that publications may have biases.

With the public data I hoped to form a general understanding of how much TC was discussed in Finland before, during and after the pandemic and how it was spoken of. As a complement to the interview data this gave insight into how aware physicians likely were of TC at different time periods and how it was perceived by different actors. What were the general points of views the physicians and other adoption decision makers had and were made aware of through these articles. How the opinions differed from one stakeholder to another.

I searched through the archives of Mediuutiset, Lääkärilehti and Duodecim, since these are the largest Finnish magazines/news sites that are focused on healthcare and aimed to physicians. I first used the searchword "etävastaanotto", which is a Finnish translation for teleconsultation. Mediuutiset and Duodecim both had 11 articles (23.9.2015-8.3.2024), while Lääkärilehti had 198 (16.5.2023-22.8.2024). 5 of Mediuutiset's 11 articles were not available to me in full. Most of Duodecim and of Lääkärilehti articles only mentioned TC offhandedly without really saying anything of it. During this review, I noticed an article that referred to phone and chat as remote contact (etäkontakti) and only video consultations as TC (etävastaanotto), so I redid the research with the remote contact term. This provided 21 articles in Lääkärilehti, but only few were new articles that discussed TC in any meaningful way. I also checked with variations of the word etävastaanotto, with scant results.

Some points of views may have been overrepresented due to my focus on news articles. Reading physician discussion forums could have shown more unfiltered opinions, but as a non-physician I did not have access to them. Only hints at the conversations in them through some opinion articles. Still, very different opinions were expressed in the articles and the data saturated well, so I feel I gained a very thorough understanding of the various points of views that actors in the healthcare field have had of TC. Particularly that of physicians.

3.4.4 Ethical considerations

When collecting data, I followed the ethical clauses strictly. That is, I always told the interviewees that they do not need to answer to any questions that they feel uncomfortable with and that they can quit the interview at any time they wish to. Before the interview I shortly explained the study, so I had informed consent for all my questions. No one was forced in any way to participate, but instead I only interviewed those who volunteered. Similarly, I always asked their consent for recording the interview.

I also guaranteed anonymity and hence I codified all personal information already in the transcription phase before data analysis. No one else was allowed to see the raw data and I kept it in secure storage on my computer. My data collection did not require contact with vulnerable groups and none of the interviewees felt the topic or any of the questions as uncomfortable to them.

3.5 Data analysis via qualitative content analysis

There are multiple ways of analysing interview data (Alshenqueeti 2014) or doing qualitative analysis in general. As with data collection a general advice is to choose the method which fits the research purpose and aim as well as its philosophical underpinnings. (Eriksson & Kovalainen 2016, 86-87). My chosen method is a categorizing qualitative content analysis. This method of analysis is particularly fitting when the aim is to create more 'factual' information but also facilitates later interpretation of meanings. Here the data is first categorized with codes so the researcher can form a clear and holistic description of the case under study (Eriksson & Kovalainen 2016, 120; Juhila 2021.). Once the codebook is created, the codes are further analyzed to find connections between them and a more in-depth understanding of the data. This allows for better validated conclusions to be formed. (Vuori 2021.) The finished product should be a model which explains the focal parts of the data. This model can then be tested and further developed by trying to find 'negative cases' which are parts of the data that do not fit the model. (Bernard 2000, 782-789.) As is common in critical realist research (Vincent & O'Mahoney 2018) in some coding traditions the final model is integrated with extant literature (Aronson 1995). In this thesis the integration of results with literature is done in the discussion area after results, so it is clear for the reader what is from the empirical data, and what is extrapolation.

Just as with qualitative analyses in general there is no exact universal method for how coding should be done. Generally, however, the researcher first makes some rules about the coding scheme. These include the size of codes, are they words, phrases or themes. Whether they are static such as the aforementioned or dynamic such as actions, actors and processes. They can also be both. The search for codes should always be based on the research questions, but traditions vary regarding how much theory guides the process. (Ryan & Bernard 2000; Eriksson & Kovalainen 2016; Vuori 2021.) In this thesis I coded both static themes as well as dynamic elements, since taking note of the actors, causal processes, structures and mechanisms is part of critical realist research. My intention was to build upon extant theories, so I tried to identify codes which fit them and codes that did not. In a sense this process was similar to the above-mentioned model testing through finding negative cases and adapting the model to fit this new information. This allowed me to complement and develop the extant theories.

To make sure my coding was consistent throughout I made clear inclusion and exclusion criterias for each code. I also made sure all relevant data was coded and the codes did not overlap. All this was done as instructed by Eriksson and Kovalainen (2016) and Bernard (2000). After this I compared and analysed the codes themselves to further merge and divide them as explained above. At the end I searched for the negative cases and adapted my model to fit them until I could find none. As a final result I had a model that included themes from prior literature but delved further into their underlying factors as well as had some entirely new aspects that had arisen from the data alone.

3.6 The background information on my case

3.6.1 The innovation

There are three teleconsultation modalities which are in active use and the focus of this study: video-consultation, phone, and chat. The video consultations were the first to be experimented with. They gained public attention once Olavi Timonen achieved good results in his doctoral thesis[3] in early 2000's by using video consultations as a long-term treatment method for diabetic patients. Afterward several public healthcare organizations working in rural areas adopted it with good results (e.g., Ora 2005; Jaatinen 2006). It was also tried out in the private sector but was then rejected due to poor customer reception. The phone differed in that it had been in use for a long time, but its usage was limited to call-backs to inform about test results and such. Not generally available for patients to reserve a legitimate doctor's appointment. Chat started to diffuse around 2015 (Keränen 2017.) in the private sector and had a better reception by customers than video. Still, just like phone and video consultations chat only became widely used and gained general acceptance during the pandemic.

The chat differs the most from the traditional face-to-face clinician meeting. The exchange between a clinician and the patient is done by typing messages in the health care organization's protected meeting platform. The clinician can handle multiple patients at once, as he/she can answer to another patient while waiting for the reply of another. The patient queue is live, so the patients do not reserve an appointment in advance but wait in line online. A chat-bot typically takes the patient's general background information and then provides the clinician with a summary of the information before the actual meeting. The efficiency is further increased due to the physician having to spend less time writing patient records as the data written in the chat can be automatically

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[3] Timonen, Olavi (2004) The Teleconsultation in general practice. A randomized, controlled study of a remote consultation experiment using a videoconferencing system. International Journal of Circumpolar Health. Vol. 63(4). 289–290.

transferred to patient records. Thus, in chat physicians can generally handle up to 9-20 patients per hour in comparison to the 3 patients per hour in other meeting modalities.

This disparity in speed is in great part also due to the fact that physicians only handle simple problems in the chat, such as renewing prescriptions or handling allergies. For more complex problems it is generally considered neither effective nor safe, so when such patients arrive to chat, they are directed to other consultation modalities.

The income per chat may vary per organization and is nowadays also based on what problem they seek to solve through it. Generally, chat was mentioned to be a little less profitable for physicians than other consultation modalities if they met 10 patients through it instead of 3 traditional consultations. With 20 chat consultations per hour, it's more profitable instead. This potential financial benefit only appeared after the pandemic started and patient demand skyrocketed.

Just like for patients, chat also provides the benefit of ubiquitous access to physicians. They can provide it from anywhere in Finland with Internet access. International provision has been hindered by insurance models, but those were in the process of changing while the interviews took place. Video and phone consultations have the same benefit, but with chat some organizations have allowed physicians to provide chat consultations without prior scheduling. They could just log in and log off when they felt like. This allowed more spontaneous and flexible working hours. The reception also did not need to be open for a physician to provide chat consultations. Hence, physicians could work longer days or at more unusual times.

While it provides these numerous advantages it also has dangers in that it is possible for more dangerous ailments to go unnoticed. This is because the patient themselves might not realize they are very ill, and physicians cannot notice some problems because of the limited sensory data and inability to do a physical check-up. The skill to notice when a patient needs face-to-face consultation is emphasized in chat consultations and is why organizations prefer experienced physicians to provide chat.

A unique feature of chat is that all its conversations are recorded. This allows other healthcare professionals to review their patients' prior meetings and provide feedback to colleagues in case of any issues. The chat platform's communication channels also enable physicians to inform IT personnel of any required improvements and to discuss cases with colleagues. Hence, the chat facilitates learning and organizational feedback very well.

Video consultation resembles traditional face-to-face meetings most closely. The main difference is in the inability to do a physical examination in favor of removing transportation costs and other obstacles caused by distance. The phone is similar but does not have visual connection. They both have fewer restrictions than chat and can be used as complementary to traditional consultations in long term care. Though guidelines regarding phone and video have also changed during the pandemic and differ from organization to organization.

Video and phone consultation appointments are generally scheduled in advance and hence they do not allow the same spontaneity and flexibility as chat does. Yet, they do offer the same locational freedom. Though the internet connection requirement may be higher for video than for chat. The main characteristics of different teleconsultation modalities described in this chapter are summarized in table 1.

Table 1: Characteristics of the teleconsultation modalities

Characteristic	Video	Phone	Chat	Traditional
Visual connection	X			X
Audio	X	X	X	X
Ubiquitous access	X	X	X	
Spontaneous scheduling			X	
Physical examination				X
Length of meeting	<15min	<15min	~3min	>15min

In this paper I refer to video, phone and chat consultations as TCs despite their differences. Many physicians are against grouping chat with video and phone as chat is generally not used for full treatment. However, according to the physician union and SII reimbursements phone should not be equated with video consultations and proper treatment either and is instead grouped with chat. Whereas my interviewees generally considered phone and video similar and chat very different with one exception who considered them all close to each other. Similarly, some Finnish literature refers to chat as a remote contact (etäkontakti) while to video and phone as teleconsultations (etävastaanotto). In the literature review I made from international papers I did not find this distinction between them. I decided to use TC for all TCs but only use it when what I am saying applied to all. Even if to different degrees. Meaning when I say ‘some thought so of TC’ it means there is someone who thinks so of chat, someone who thinks so of video and someone who thinks so of phone at the very least. Or if it’s a specific person I am referring to then they themselves referred to the TCs generally. I refer to the TCs specifically as video, phone and chat when I want to make the distinctions between them clear or who I am referencing spoke of them specifically.

3.6.2 Interviewee information

Each of the physician interviewees has extended clinical experience, and more information can be found from the appendix. The KEMUT interviewees are referred to via the letter K while physicians via H. All KEMUT interviewees quoted in the results chapter are managers in Finnish private healthcare organizations. The table 2 presents physician interviewee information regarding their adoptions of the teleconsultation modalities.

Table 2: Physician interviewee information

Interviewee	Adoption of chat	Adoption of phone	Adoption of video
H1	At the start of the pandemic.	At the start of the pandemic.	At the start of the pandemic.
H2	Oversaw initial trials.	2018-2019.	2018-2019.
H3	5 years before the pandemic	During the pandemic.	During the pandemic.
H4	Did not test or adopt.	During the pandemic. Later than most colleagues.	Did not test or adopt.
H5	Tested a year before the pandemic. Adopted during early pandemic.	Adopted during the pandemic.	Did not adopt.
H6	Did not test or adopt.	Adopted during the pandemic, in step with most colleagues.	Adopted during the pandemic, in step with most colleagues.

4 Results

In chapter 4.1 I lay out the situation in the Finnish healthcare field prior to the pandemic. Meaning, to what extent had the teleconsultations (TCs) diffused before the pandemic started, and what attitudes physicians and other stakeholders had about TCs at that time. In chapter 4.2 I present the situation after the pandemic started. My goal in writing these two sub-chapters 4.1 and 4.2 was that the reader could understand not only the two states of little diffusion before the pandemic and widespread diffusion after the pandemic, but also the process by which the situation changed from one to the other. In chapter 4.3 I create a synthesis of the results and try to better present the essential results that answer to my research questions regarding the interactive elements within the diffusion process and the influence social and rational drivers had on the diffusion. First in Figure 6 are some central events regarding TC diffusion.

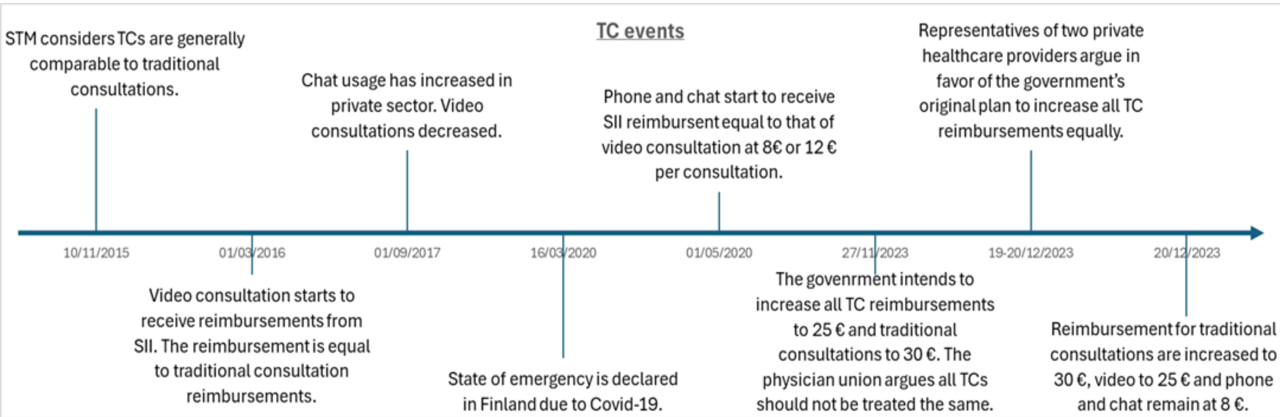

Figure 6: Central events regarding TC diffusion[4]

The greatest effect by far on TC diffusion was the pandemic. In the following graphs are some illustrations of how the diffusion of TCs was influenced by the pandemic. This figure 7 is from SII statistics.

[4] STM 2015; Keränen 2017; Valtioneuvosto 2020; Heino 2020; Lääkäriliitto 2023; Tauriala & Oikarainen 2023; Kainonen 2023.

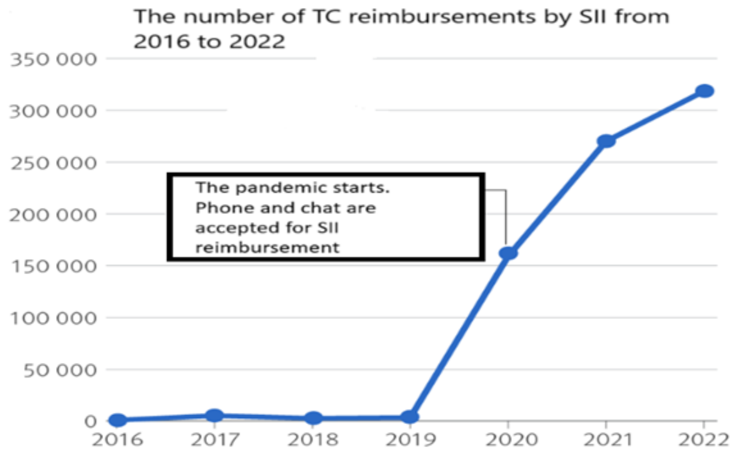

Figure 7: TC diffusion according to SII statistics

This SII graph is illustrative of teleconsultation diffusion in Finland because it includes all reimbursed teleconsultation use and therefore shows practically all private sector TC use. It also shows the diffusion of TCs for several years into the pandemic. Its drawback is that it does not account for chat-usage until the year 2020, which is also when the pandemic started. Hence it alone is insufficient for evaluating teleconsultation diffusion before the pandemic as according to Keränen (2017) some healthcare providers already had thousands of chat customers monthly. More insightful data regarding each of the teleconsultation modality's diffusion can be found in private healthcare organizations' annual report presented in figure 8.

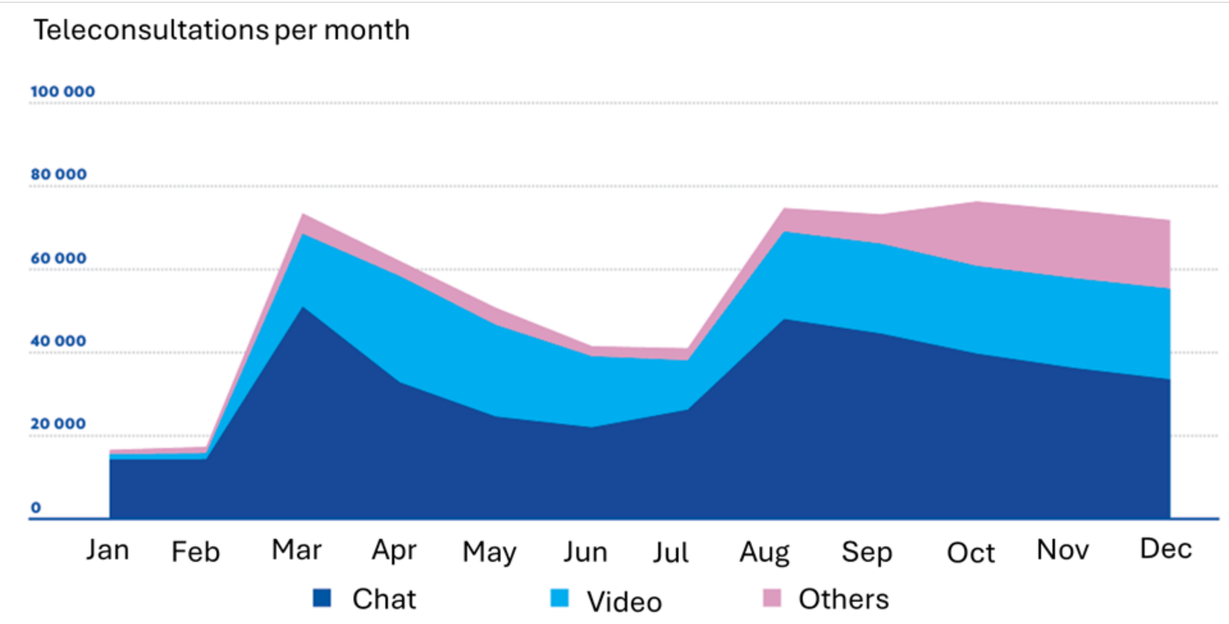

Figure 8: Terveystalo's year 2020 teleconsultations

According to Terveystalo's annual report they alone had over half a million teleconsultations in 2020, and their usage quadrupled between February 2020 and March 2020 (Terveystalo 2020). The greatest relative change seems to be in video consultation usage. Because of the conflicting statistics I cannot say for certain how great the change was exactly, but it is clear the change the pandemic brought to teleconsultation use was great and abrupt. Enough to change how individuals and institutions in the field of healthcare perceive and approach teleconsultations. In the following I try to tell the story of how the perceptions regarding TCs changed from before until after the pandemic.

4.1 Pre-pandemic diffusion and atmosphere

The sources differ in their perceptions of the diffusion process of teleconsultations (TC). Thus, somewhat different stories can be formed about it. The major interpretations of the pre-pandemic situation are: 1) Particularly physicians' incompatibility with TC caused negative evaluations of its relative advantage and thus limited diffusion. 2) Most of the benefits of TC did not exist for physicians before the pandemic. 3) Most physicians had nothing against TC but were content with their current situation so did not pay enough attention to it to notice its benefits.

4.1.1 Incompatibility caused relative advantages to be perceived as negative

As evidenced also by the SII graph, the diffusion of teleconsultations prior to the pandemic was considered slow by many. In the KEMUT interviews the reason for this was seen as mostly related to compatibility. With the exception of some forerunners, both physicians and customers were said to be generally reluctant to use the TC technologies as 'it was not how medicine was done'.

> The problem was that we couldn't get the doctors to join us in the teleconsultation world, -- they thought that the client has to come through the door, that they want to see and try the client, and they really want a physical reception. And then the customers also, most of them felt that yes... traditionally you go to the doctor, just physically. (K1)

The whole idea of providing remote care apparently raised a fair amount of negative emotions and even critique against the TC system developers themselves. The public data also implied that there was a considerable clash of views between different physicians and stakeholders regarding TCs. For example, Kandell (2020, 2023) and Seppälä and Seppälä (2020) say physicians resisted TC adoption until the pandemic. Several early articles also seemed to promote TCs to physicians by mitigating any worries they might have. They did this by interviewing physicians who provided TCs and their patients (Lahti 2004; Jaatinen 2006) or they talked about successful projects (e.g., Lahti 2003, 2004; Sariola 2004). This worry mitigation aspect appears in some of the headlines.

> Teleconsultation does not scare the patient. (Lahti 2003)
>
> Teleconsultation fits well as a physician’s work tool. (Lahti 2004)
>
> Effectiveness from technology to home treatment “No one has feared video consultations with a physician. (Jaatinen 2006)

Thereby hinting at the general attitudes of distrust toward TC. The critique of TCs was mostly regarding its medical quality and safety. Many (e.g., Hietanen 2016) felt there was not enough research data to be sure of the consequences that widespread diffusion of TC might have. A general concern among physicians was that the patient’s ailment does not always get sufficiently clarified at a virtual meeting (Ronkainen 2014). This concern is manifested well in Hietanen’s (2016) question:

> Are they [patients] choosing availability at the expense of quality? (Hietanen 2016)

The government seemed to have a more positive perspective on TCs as the STM stated that TCs are generally comparable to traditional consultations (STM 2015) and video consultations received equal reimbursement by the social insurance institute (SII) as traditional consultations in 2016 (Pihlava 2016). Meaning 8 euros for general physician consultations and 12 euros for specialist consultations. Yet, physicians continued to raise worries. Digitalization apparently caused some to believe that the physician job was changing irrevocably (Ronkainen 2014; Seppänen 2016a; Orre 2017). Some commented on this more neutrally and simply discussed the pros and cons from the patient’s safety perspective (e.g., Ronkainen 2014; Seppänen 2016a). Whereas others saw a somewhat dystopian future as a potential route where physicians were mere middlemen between technology and patient without having any creativity in the job description. Physicians were called on to resist this and remember the importance of human contact as an integral part of patient care. (Orre 2017.)

> Our work is becoming ever more technology oriented. We should not submit to becoming mere technicians and talking heads of artificial intelligence. In the universe of virtual worlds, artificial intelligence, and remote contacts there is an important reservation for our greatest skill: humane contact. (Orre 2017)

One KEMUT interviewee mentioned many accepted the field would change but hoped they would retire before it happened. This dislike by some for the future that they expected further digitalization to bring may have hindered diffusion by allowing decision makers to use questionable reasons as obstacles for adoption. For example, some wondered why information security was a factor preventing TC diffusion when using paper to archive and send information was acceptable, yet a lot less safe. Particularly when later on pandemic caused fast diffusion this was no longer a limiting factor even though a technological improvement in safety did not happen simultaneously. (Seppänen & Seppänen 2020.)

Yet, while this aversion to digitalization and TC existed, generally the opinion pieces raising doubts about TC did not reject it entirely. They saw it had lot of potential but that it was being implemented too widely since there was not enough research data to be sure of the consequences (e.g., Hietanen 2016). Hence, some considered the spread of TC too fast, and others too slow. In both the KEMUT and physician interviews young physicians were said to be considerably more accepting of digitalization than older physicians. Still, they also had mixed feelings about TC. In a 2015 survey of recently graduated physicians 40 % had no interest in providing TC. Their general concerns were regarding their ability to clinically examine and communicate with the patient properly via TC. There was a concern of a TC physician being a mere rubber stamp, who took responsibility for the patient without being able to properly examine them. Yet, despite these concerns most were open to trying TC in the future. (Niemelä 2015.)

While managers seemed in general more eager to adopt TCs than physicians, there was some resistance among them as well. My earliest adopter interviewee mentions that there was very little internal marketing for their digital clinic that was responsible for chat provision. In their organization the chat was also only available for certain occupational health care customers early on. He felt that this was in part due to some of the top management sharing the general aversion towards TC. This would also explain why so few of my interviewees had even heard of TC before 2019. Many of the managers in healthcare are also physicians and hence shared the aversion to the potential changes to healthcare that digitalization might bring. They also shared the same education which was mentioned to emphasize strict protocols on how care is provided to ensure safety and quality. Another likely reason for the limited marketing was that the organizations did not wish to alienate any customers by pushing TC with too strong marketing while they were still uncertain of it and the insurance firms also did not reimburse chat well early on.

> I think that resistance to change was the most important factor [as to why TCs were not promoted strongly]. It was known that physicians would be hesitant. Patients were thought to likely hesitate as well and for sure no one wants to risk that patients get angry. (K4)

In sum, there appeared to be strongly contrasting views regarding the safety and quality of care that could be provided through TCs. Some implied that much of the opposition to TCs was due to general aversion to digitalization and change rather than objective analysis of the innovation’s costs and benefits. This emotional aversion to digitalization was also evident in some of the oppositional opinion pieces. Thus, incompatibility clearly played a role in hindering TC diffusion.

These discussions provided evidence of a social explanation for negative evaluations of TC as some physicians expressed fear they would lose some of their current position and prestige as digitalization takes over and thus it should be resisted. Yet, rational reasons to be sceptical of TC use were also given. Education and professional ethos also likely influenced how innovations are evaluated. Which is an example of the system influencing the individual in a manner that influences their interpretation of an innovation's characteristics.

4.1.2 Teleconsultations diffused within the limits of the benefits they provided

The KEMUT interviews and the public data imply there was a hot debate among physicians and other healthcare professionals regarding the safety and quality of TCs prior to the pandemic. Yet generally my physician interviewees had only heard about the possibility to provide TC only a year or so before the pandemic started. This does not allow for a long period of resistance where traditionalism prevailed over progressivism.

My interviewees were all private sector physicians however, and the video consultations only spread in the public sector at first. Apparently private sector organizations tried to provide video consultations with great expectations in 2015, but they did not gain sufficient customer demand to keep them up. (Keränen 2017.) It seems the technology was not easy enough to use at the time for paying customers to prefer it. Hence, the reason for the failure of video consultation adoptions to sustain in the private sector early on was more due to technological limitations and customer preferences rather than physician reluctance.

Instead of video consultations it was chat that gained popularity in the private sector from 2016 onwards with great expectations. Some organizations had thousands of chat customers monthly. (Keränen 2017.) Since physician reluctance was still mentioned as a cause of slow diffusion, they must have had even greater expectations for it. The reason behind managers' more positive attitude toward TCs seemed to be that TC's benefits were more incentivizing for them than for physicians. As they tend to look at the business side and hence be more interested in maximized use of organizational resources which TCs allowed. If many physicians worked from home using TCs this would also allow organizations to use the same number of offices for a larger number of physicians. Thus, saving in property related expenses.

In contrast for physicians, an early adopter said that most of the relative advantages of chat were not present for physicians prior to the pandemic as there were so few patients using the remote services. This meant that instead of the physician meeting multiple patients simultaneously and dozens during a day there were maybe 10-20 patients a day. Because of this, rather than the physician providing chat-consultations relatively spontaneously as they can today, one physician had to be on a 12-hour call duty for the day. Besides being more inflexible timewise chat was also less profitable financially for the attending physician. Thus, it was neither financially advantageous nor timewise flexible for the physician. Chat consultations had to spread among both patients and physicians in step for it to provide its current relative advantages to physicians.

Hence to summarize, it may not have been just physician incompatibility based on educational and professional differences, but that the benefits to physicians and patients appeared later than they did for managers. This may have also been a reason for the relatively weak internal marketing of TCs if managers acknowledged that the benefits to physicians were not yet obvious.

4.1.3 Physicians felt no need for them

Most of my interviewees had been offered the chance to provide TCs in 2019, yet generally they were not interested and did not try it out. The reasons given for this were that they already had their receptions full of customers and, hence, did not have a need to try something new. They were content with their situation. So even when some did not have anything against TC, they simply did not give it much thought. One mentioned that part of this dismissal was due to having gotten so routinized to providing medicine face-to-face that they did not give alternative methods much thought.

I had one interviewee who was an exception to this and tried out chat well before the pandemic and sustained adoption for several years. He adopted it approximately five years before the pandemic. The interviewee tells that what made him try it out was simple curiosity rather than any relative advantages the technology provided.

> I have always been a little curious toward it, that if something new comes up then I have to see it through. (H3)

He had for a while before wondered why certain patient meetings could not be done remotely to save the patient’s time. So, this experiment with chat allowed him a chance to see whether remote consultations could work. Due to his good income as a physician the decrease in earnings did not bother him overly much. Hence, financial slack supported innovativeness here unlike with the other interviewees.

Yet, simple curiosity would not sustain interest for long as the novelty of the innovation faded with experience. Instead, what sustained the adoption was the feeling of belonging and being on a mission to accomplish something with a cohesive group. They had the goal of improving the chat so that one day it would become more. He mentions that particularly the IT department's clear commitment was motivating for him as well.

Once the pandemic started the chat became an overnight success and demand overrode supply, forcing him to work very long hours. However, once many other physicians adopted the chat as well, he noticed the old group had disappeared under the influx of new members. Thus, even though the chat's relative advantages increased greatly financially and flexibility wise, he discontinued its adoption. Hence, showcasing the importance of individual perceptions and connections to technology, besides its technological and financial advantages.

In sum, Physicians' situation was so good that many did not feel incentivized to learn about the potential benefits of TCs and hence did not become aware of them. It required a curious personality to play around with an innovation with uncertain benefits. Yet, his great financial situation as a physician allowed him the freedom to do so. So financial slack both diminishes incentives to innovate but also allows freedom to do so. It is then individual characteristics that determine the innovativeness in such a situation. This also showed how communities can form around an innovation and become the main reason for continued adoption as they improve the usage experience and how the innovation's potential is perceived.

4.1.4 Summary of the pre-pandemic section

The TC's diffusion before the pandemic could be explained in three distinct ways. According to the first story incompatibility of mainly physicians deterred TC diffusion before the pandemic. The reasoning followed social account perspective in that some feared what change would do to their positions. The reasoning to reject was also rational, in that they perceived TC work as less enjoyable and its quality and safety was uncertain. In this perspective the social system's culture played a large role in determining how favourably the innovation is seen.

The second perspective to explain TC's diffusion process was that the innovation's relative advantage to physicians and patients was weak. Hence, the diffusion was slow only from managerial point of view for whom the benefits were greater. Thus, the diffusion process was rational.

Third way to explain TC's diffusion before the pandemic was that physicians were simply so content in their situation that they did not pay enough attention to TCs to properly evaluate them and see their benefits. The financial slack hindered innovativeness except for individuals innately curious of the innovation and its potential.

The real story is likely a combination of all three with different individuals experiencing TC's diffusion process differently. These stories show how simultaneously some can be driven by social reasons while others rational and some by both at the same time as social reasons may influence how the technical features of an innovation are interpreted.

4.2 Diffusion during and after the pandemic

4.2.1 Initial effects of the shock

When the pandemic hit it inspired great fear of infection, so a lot less patients came to face-to-face consultations. This changed the situation dramatically for many of my interviewees since they no longer had receptions full of customers. Simultaneously the demand for chat and the other TCs skyrocketed. The early adopter told me that at the onset of the pandemic there were only the original few physicians answering the chat, but the demand jumped from a maximum of a couple hundred a day to thousands per day. The interviewee mentioned working 72-hours straight just to try and answer to the demand. With the sudden increase in need, particularly experienced physicians were contacted to see if they could help in the chat. Seeing the need while having free time themselves many tried it out.

> My colleague said - - join us, we have tons of demand, but there are only a few of us here. And I was like okay. The work situation changed entirely when Covid arrived. - - I had always had my reception full, yet now when I came there were no patients, because they did not dare to come. So automatically I thought, well I have to figure out something else. (H1)

So first the relative advantage of TC skyrocketed due to the pandemic as it became the only way to meet patients for many. With proper incentives now in place many wanted to try it out. Because the interviewees' organizations already had the systems in place and wanted their physicians to adopt it, trying them out was easy. The interviewees generally considered each of the TC technologies relatively easy to use. All had already used the phone to contact patients to relay test results and the like. Providing video consultations was not a big leap from there. Particularly since the interviewees' organizations' IT departments helped with the set ups. Chat differed from the traditional method the most, but those who tried it felt it was easy to use even as a beginner with little IT knowhow. The organizations also provided demonstrations for how to use chat, thereby lessening technological complexity as an obstacle to adoption. The physicians could also freely see each other's chats, so there was high observability in chat as well.

Hence, technological complexity was not a problem if one was interested in trying out any of the TCs. Still, some of the interviewees chose not to try chat even after Covid-19 came to Finland. They still did not have a need to do it and either did not want to meet patients that way or felt they would not be quick enough writers to keep up with the pace chat-physicians were meeting patients at.

Some of the KEMUT interviewees suggested the pandemic might have increased compatibility with teleconsultations because people got accustomed to doing things with remote technologies in general. When work meetings were already in Teams or Zoom it was not much of a jump to start using them in other aspects of life as well. Thereby the issue of incompatibility was decreased as an obstacle to adoption.

The public data also describes a clear change in attitudes toward TC. Using TC whenever possible was now called the responsible customer decision (Keränen 2020) and HUS for example substituted traditional consultations with teleconsultations whenever possible (Vierula 2020a). Some institutions changed their policies to aid TC usage (Vierula 2020b). The effect the pandemic had on demand varied drastically between different medical fields and sectors. In the private sector 80 % of physicians reported having less work than before the pandemic despite the increase in TC provision. (Pelto-Vasenius 2020.) Physician attitudes were said to have changed overnight from negative to positive (Kandell 2020) as well as patient attitudes.

> Covid made a huge change to doctors' opinions and also customers' opinions [regarding TCs]. I have been eight years at - - and it is certainly the greatest change of all. (K1)

For some organizations (Honkanen 2020) and for some ailments (Seppänen 2022) TC was recognized as a saving technology that allowed care to continue. The problems that previously hindered TC diffusion such as concerns over cybersecurity, governance-related issues, equality or just generally aversive attitudes were no longer a barrier. The attitude change was so great that the writers who for long lamented the slow pace of diffusion now thought actors on the field are perhaps too eager to use TC for everything. (Seppälä & Seppälä 2020; Schugk 2022.)

> Until recently, TC was shunned. Now the opportunity is being seized in the same way that two Finns seize the opportunity to meet in a far-off land. The reception sounds familiar. There is something in common. (Kandell 2020)

> Lines are apparently more cryptic and minds more open than ever before. Now that all these data protection and equality issues, which for years have restricted remote working, are magically solved by COVID-19. (Seppälä & Seppälä 2020)

In sum: findings related to interactions were that 1) the pandemic changed the environment (system) so that the innovation characteristic of relative advantage improved greatly. 2) Through use of the innovation user perceptions of it changed. 3) Organizational support mitigated the complexity of the innovation. 4) The pandemic did not change the situation for some as much, and the relative advantage of TC did not increase for them similarly. Some also did not feel compatible with them. Low relative advantage and incompatibility were reasons to not adopt or abandon after adoption.

The finding related to social and rational drivers of diffusion was that relative advantage increased greatly for society at large during the pandemic as there was no risk of infection when using TC. General attitudes changed to far more accepting of TCs. Institutions also started promoting TC as a responsible choice. Hence, there was now some social pressure in favor of TCs or at least the pressures against TC adoption were greatly decreased.

This shock affected each of the reasons TCs did not spread so fast before the pandemic. Because of it, physicians had a real concrete need to use them, hence many were no longer content in their situation without them. Incompatibility decreased through experience with them and relative advantage to physicians and patients increased greatly during the pandemic.

4.2.2 Renewing discourse about teleconsultations' costs and benefits

Teleconsultations were often discussed as one solution to improving care availability and cost-efficiency (e.g., Orre 2020; Pihlava 2020; Pennanen 2021), but some questioned this and believed there would be failure demand due to the poorer quality of the consultation (e.g., Hyytiälä & Mäntyselkä 2022). Meaning patients would come back repeatedly since their problem did not get solved via TC. One interviewee thought that besides failure demand chat causes unnecessary demand, as people come there with problems that do not actually need treatment.

Research data about safety, cost-efficiency, patient satisfaction, and quality of TCs were still considered lacking (Pesonen et al. 2023). Some organizations like HUS, however, had good experiences of patient satisfaction and so continued to implement more video consultations (Pihlava

2023; Kosonen 2023a; Toikkanen 2024). Some changed their minds after personal experience. In one well-being services county for example, the organization's leader who was also a physician had been very skeptical of TC but changed his mind entirely after seeing they did not gain more failure demand after implementing TC in large scale (Kauppinen 2023).

Opinions differed also on the effects TC has on care access. Espo (2022) worried that physicians' trend to provide TCs might be decreasing the availability of traditional consultations. Oikarainen et al. (2022) disagreed, noting that the poor availability of traditional consultations has long been a problem and TCs are improving the access to care.

Those critiquing TC diffusion often raised concerns about how trust between patient and physician could develop in a remote meeting and so doubted the patient could talk of really difficult matters. This was presented as one reason why even video and phone are fit only for treating simple problems. (Eg., Korhonen 2021). In contrast some of those who provided video and phone noted that often patients talk more easily about their difficult problems via video or phone. That they might even be the only connection through which some patients dared discuss their difficult issues. The reasons for this were thought to be that the patient is likely more comfortable talking about these issues from their home, where they feel safe (Krohn 2021), or the distance between the physician and patient made it possible to bring up the fears they had (Murtonen via Gronvall 2016; H5).

My interviewee also mentioned that meeting these patients with difficult and scary problems was often easier remotely from home. Due to these same reasons as were mentioned for the patient. This was one unexpected realization that some physicians learned after providing video or phone consultations. That in addition to their limitations in medical quality phone and video might have a medical quality related advantage over the traditional consultation. That some patients would come to be treated earlier because of TC. One of my interviewees last year, for example, had received more patients with breast cancer than she had in her traditional practice and had been able to send them to care quickly. In an ailment where its early detection is of crucial importance having an easier pathway to physician consultation can save lives.

Stories of learning like this were quite common among my interviewees and the public data as well. Generally, my interviewees did not have strong objections toward TC before trying it out, but many had doubts and uncertainties about it. Particularly regarding its safety and how well they could help their patients with it, since it had its limitations, and healthcare had been provided face-to-face for so long without those limitations.

By using TC, they learned when it was useful and when not. They learned healthcare could also be provided in this manner and thus, incompatibility as a reason to reject the innovation decreased. Once they tried it themselves the benefits of it became clearer to many. Particularly how it could help patients to have better access to healthcare. This was a common reason for the interviewed physicians to adopt one of the TCs. They did not want their patients to have to drive all the way to the clinic if it could be handled over phone or video. They did not want their patients to have to wait in line needlessly for simple prescription renewals or the like, if they could answer to their needs faster with chat. This was thought to free time for other physicians to treat individuals with more complex problems thoroughly since they did not have to spend time with simple problems. Because they found themselves to be able to help their patients like this, others' negative views did not really bother them. Believing they would change their mind if they tried it themselves.

> For me (collective acceptance) does not really matter, because I see it myself, that when I act like this it is safe - - If someone else comes, who has not tried it and says it's not safe, it does not really bother me, because, I think, if they saw that we treat for example birch pollen allergy – it is a really simple ailment, everyone knows what it is about, and then they do not need to queue there for long queues, then I think it is a very welcome method to treat such things. (H1)

Some noted that phone and video were enough a lot more often than they had thought. As an example, one physician explained that in many cases symptoms do not flare up in physical examination, but at irregular times during the day or night. In these scenarios symptom diaries and detailed discussion of symptoms and other factors is crucial. Thus, by providing video and phone consultations he further realized their importance. Video and phone are mentioned to require more communication skills (e.g., Seppänen 2016b; Pyörälä through Pennanen 2022a). Yet some say they also learned to become better listeners and communicators by providing it (e.g., Krohn through Pennanen 2022b; H4). My interviewee also noted that with proper discussion combined with reading the patient's electronic health records he was almost always able to help the patient with their problem.

This is a key notion. Many TC physicians were happy with being able to help the patient through TC. They did not need to be able to solve it entirely in the remote session, but as long as they could make progress in solving the problem via TC then providing TC was worth it.

Hence, one interviewee tells that due to this finding, he recommended as a supervising physician that everyone in his department provide their consultation times dynamically. Meaning traditional, phone and video consultations indiscriminately. Apparently, this did not have much of an effect as physicians follow their own beliefs.

One interviewee explained that adjusting to new methods of care provision can be difficult for physicians because they are taught very strict procedures on how everything should be done in school. Realizing it would be okay to bend the rules a little bit when the situation requires it to help someone, often necessitates having experience and trust in one's own skills to recognize what is essential in the situation. Similar comments about realizing the essential from under the red tape were also mentioned in the public data (e.g., Krohn via Pennanen 2022b).

But as mentioned this requires experience. As does figuring out when the patient cannot be treated remotely and needs to go see a physician face-to-face. This latter one was often mentioned as the most important skill of a physician providing TC. Hence, while younger physicians were often mentioned to be more open to digitalization, TC was not recommended for them.

Some also worried about the effect TC provision would have on the future development of medical care if adopted widely. Speculating if the importance of proper long-term treatment would become devalued and thus related clinician-skills deteriorate (Kaarisalo 2021).

Key insights: after the initial shock there was renewed debate regarding TCs costs and benefits. This by itself shows that TC was enough ambiguous as an innovation and touched areas or medical work where individual preferences and opinions differed considerably that very contrasting interpretations of it could be made. It also deviated from the conventional way of work which allowed more speculations of its long-term effects.

Some of the negative opinions likely caused social pressure to not adopt the innovation. The positive ones generally did not claim that not adopting was bad, so they likely did not produce social pressure to adopt but likely provided support against negative peer pressure and gave rational reasons to adopt. Some commented that scientific evidence regarding TCs was lacking, but main basis for arguments appeared to be largely based on the physicians' own thinking, relying on their expertise, and then on their personal experiences with the innovation.

Difference in the physicians' salient goal appeared to also differentiate physicians. A physician's goal is usually to solve the patient's health problem. TCs are generally worse for this, because they provide less information and allow less actions by the physician. Yet, a physician also has the goal of helping patients. For this TC provides benefits, because it eases the patients' access to care. Which of these goals the physician is more oriented towards may in part explain their attitudes toward TC. These findings showcase the importance of how the innovation fits the pre-existing system and how individual adopters make sense of the innovation.

Trying out the innovation often led to learning and more positive evaluation of the innovation. Stories of learning were practically all positive. Which implies the general assumptions regarding TCs were more negative than necessary. Rational reasons present in this data were that the physicians had incorrect beliefs about what is important or necessary in patient meetings and thus assumed that the limitations of TC were worse than they turned out to be. TC also had some unexpected benefits they did not realize before experimenting with them. Likely because it is such a new way of doing medicine. Hence, the observability of the innovation's benefits is influenced by the norms of the system. The more open minded may better perceive the benefits of an unusual innovation.

Yet sometimes opinions did not change after receiving more information. The perceivable rational explanations based on the data is that the individual did not consider the benefits of TC as important as its negatives due to difference in values, preferences, or salient goal. Alternatively social account explanation is that when the decision making is based on social reasons then rational reasons do not matter as much.

4.2.3 Realized costs and benefits to physicians

Besides these benefits to patients the physicians also realized the benefits of TCs for themselves. Chat was noted as the most flexible to use, because the physician could login spontaneously. All TC's allowed working from a summer cottage or home and hence allowed physicians to better fit work and relaxation times together. Some noted that they could relax better between patient meetings when working from home or cottage. They could also spontaneously help some patients via chat if they had slack time while otherwise on a vacation. So, providing TC's and chat in particular fit well with the physicians' other areas of life. Which is why it was common to market chat as something to do while vacationing (e.g., Seppänen 2017) and TC was considered particularly good for physicians with a family (Kandell 2024). This change however, happened later on, since before the pandemic the attitudes appeared more strict regarding the facilities from which TC should be provided from (*Compare*, Seppänen 2016b *with*, Kandell 2023).

Since chat and phone did not have a visual connection, physicians did not have to prepare themselves to be as representable for the consultation as they otherwise would have to. Thereby saving time. Many also liked not having to show their face in general. Some disliked how patients might evaluate them based on factors that were irrelevant to medical quality such as looks. Not having the visual connection could also make talking with really scared patients a little less stressful. Because video has visual connection, some felt that many of the benefits chat and phone provided were removed and hence video was like traditional consultation in its inflexibility, yet of poorer quality and hence, did not provide it. Others felt differently and thought it of higher quality than phone, but with similar benefits in flexibility. Particularly for the patient.

Downsides of TCs were also noticed through use. For example, in addition to these stress alleviating factors TCs and especially the chat could also facilitate overwork and burnout, since physicians had constantly the option to do more work. Particularly since many also reported loneliness as one downside of remote work (e.g., Pennanen 2022; Kandell 2023). One of my interviewees also mentions that she never got similar satisfaction of having helped people through chat, so trying to reach that satisfaction with chat was one factor leading her to overwork herself and burnout.

Particularly chat was also considered to not facilitate skill improvement, besides maybe becoming faster at meeting chat patients. Hence, chat and to some degree phone and video did not allow for an individual to reach the status of an expert with it, but rather fall behind others in skill development.

In sum: One of the most important benefits to many was how well TC fit with their other areas of life. Hence, the relative advantage of the innovation was dependent on how the innovation fit with the adopters' 'shadow systems'. Besides changing how physicians work TC also changed when and where physicians could work. Though this feature of the innovation was dependent on legislation as there are legal limitations where physicians can work from.

Individual preferences influenced how beneficial certain features of the innovation (e.g., having a visual connection) were considered. Hence, relative advantage was dependent on the innovation fit with adopter characteristics. Since TCs did not facilitate expertise building it did not have the potential for status gains and hence provide social reasons to adopt that innovations with such potential do.

4.2.4 Polarized debate regarding the roles of physicians and patients

One of my interviewees stopped providing chat because she felt she could not evaluate her patients properly. What if the patient left out information that was related to their problem but did not know it. Hence, causing the physician to treat minor symptoms rather than treat the person holistically as a physician could with a longer appointment. This left too much responsibility of the patient's care for the patient to recognize what kind of a problem they had and what type of care they needed. Hence, she could not justify providing it. The idea that her patient might die because she met them via chat rather than in a longer format consultation was unacceptable to her.

Other interviewees were also aware of the risk she described but felt it small enough to be acceptable. Largely because they were so careful to immediately direct the patient to traditional consultation if anything seemed off, trusting their experience in this. But also, because they had noted the patients seemed to have understood well what chat was for and rarely came there with issues that required other types of treatment. These were also given as reasons for chat’s safety in the public data (Keränen 2017).

One interviewee had similar worries about her ability to estimate the safety of video consultations regarding patient privacy. Yet, throughout her career she had noted her patients’ parents were generally smart young adults and so she felt them competent to decide how they wished to meet. So, she decided to provide video consultations trusting her patients to know what they wanted and the risks they were willing to accept.

These worries the physicians raised and their decisions regarding them showed their perceptions of the patients’ and physicians’ roles and responsibilities to be an important factor deciding whether the physician sustained adoption of TCs. Particularly that of chat, which had by far the most uncertainty in regard to patient safety.

These varying opinions on the role of the physician, the patient and their relationship also showed up in the public data. Most clearly in an exchange between Korhonen (2021), Krohn (2021) and Kandell (2021). Korhonen critiqued how public organizations were implementing TCs in such a way that the physician was treated like a consultant. She felt this care model TC did not allow proper physician-patient relationship to form and physicians could not give proper long-term care. Korhonen believed this method of care provision went against the professionals’ work identity and was hence causing them to wear out.

Krohn (2021) countered this view by arguing that the patient has an active role in their healthcare and the physician is a consultant who helps the patient take care of their own health. She continued that TC can provide a better care relationship, because the power-relation is more even, since the patient gets to consult the physician from a place they are comfortable in. In contrast Kandell (2021) thought that making the patient the decision maker is like having an amateur paint a house instead of a professional. Except that besides wasting the amateur’s time, now also the professional’s time was wasted.

These differing views sometimes culminated as open critique toward TC-providing physicians, as those who did not think patients should be given responsibility over their care considered physicians doing so are irresponsible. The critique was particularly aimed at those who only offered remote care. Some even referred to certain TC provision as quackery (Krohn through Pennanen 2022; Tolvi et al. 2023).

> There is also prejudice among doctors. Krohn has encountered ‘total dissing’ and quackery accusations on discussion forums toward colleagues who do remote work. (Pennanen 2022)

> The most important of all is the ability to invite the patient to a local appointment if necessary. Without this ability, you quickly go from medicine to quackery. (Tolvi et al. 2023)

Some were bothered by how polarized the conversation around TC had become (Pennanen 2022; Seppänen 2024), yet none of my interviewees had felt peer pressure to not adopt any form of TC. Generally, they were not even interested in how others felt about the innovation, since they had made their own evaluation and trusted their expertise. They said their colleagues also acted according to their own evaluations, even if their superiors encouraged differently. Though one mentioned that younger physicians might follow peer opinions more than older ones since they might not have developed similar confidence yet. Additionally, while there continued to be some critical voices among the public articles the general climate toward TC appeared to have become very accepting once the pandemic started. Hence, it is not surprising the interviewees did not experience critique from their near colleagues. One interviewee did mention having tried out phone consultations so she would not feel left behind by her younger colleagues. So, social influences were a factor for some physicians as well.

The central insight was that a key factor behind the varying evaluations of the innovation were the physicians’ differing perceptions of the role of the physician and the patient. These perceptions of their roles are developed in the interaction between the social system and the individual. This then determines how certain characteristics of the innovation are evaluated. Hence, it is an example of how the interaction of all three elements (innovation, system, adopter) leads to a decision to adopt or reject an innovation.

Perhaps because the innovation’s use touched upon many physicians’ important values some strong opinions were made of those who use TCs. Thus, placing considerable social pressure to not use them. Yet none of my interviewees experienced peer pressure enough to take notice of. It seems those negative opinions did not reach all that many people despite being stated publicly. Or my interviewees simply did not pay much attention to such comments.

4.2.5 Institutional and financial biases

Opinions seemed to follow group memberships to a certain degree in the public data. The clearest differences were between private healthcare provider organizations' representatives and representatives of the physician union. This became more evident when the Finnish government intended to raise the reimbursement of all TCs (video, phone and chat) from 8 euros to 25 € per consultation (Seppänen 2023). The physician union argued against this. Their view was that chat – and generally phone – should not be reimbursed as much as video consultation. Arguing these do not compare to traditional consultations or to real TCs in their quality of service or in the time and effort spent by the professional. (Kosonen 2023; Lääkäriliitto 2023.) Physician union's head of division commented they worry that having the reimbursement be even for them all would drive demand toward quick chat meetings, which they did not consider as cost-effective as others (Seppänen 2023).

Representatives of two private healthcare organizations responded to these arguments with their own. First Tauriala and Oikarainen (2023) noted there is no scientific evidence that chat is not as cost effective and argued that chat has several advantages to traditional care such as faster treatment and better documentation of the meeting and hence monitoring of care. Soon after Kainonen (2023) representing another firm added to these arguments pointing out that the firms had invested a lot to improve their digital services such as chat so that patients for whom chat fit received as good care as they would in the traditional consultation except a lot faster. Hence, she argued there was no reason to require the professional to spend an equal amount of time with the patient in different meeting modalities to receive the same reimbursement.

So, from this it could be seen that there were clear differences between how different institutions and organizations felt about chat and other TCs. In this specific case there was a clear monetary incentive for companies to argue in favour of higher chat reimbursements. In another example when Schugk (2022) critiqued some aspects of current TC provision private company representatives (Oikarainen et al. 2022) pointed out that Schugk is a senior physician at a mutual pension insurance company when counterarguing his points. By doing so they seemed to imply his criticism of TCs had to do with his position in the company. These are of course examples where an individual represents their organizations views publicly. So, it does not mean there is any sort of consensus within these organizations. Which is not necessarily the case, as my interviewees told me. Yet, there are more accepting or opposing atmospheres toward TC depending on the organization and its department. Private firms were also generally considered more open to innovations than public organizations.

> I do believe that there is still a lot of resistance in the medical profession towards telemedicine and probably especially in the hospital world, because there is that kind of very conservative attitude towards things. (H3)

Political attitudes were said in KEMUT interviews to change radically from one government to the next. Which is why the SII reimbursements also change in time considerably.

In sum: Organizations and institutions had contrasting stances in regard to TC use and they had different incentives behind their opinions. In public data it may thus be difficult to tell whether the writer is expressing their own opinions or those of their organization.

5 Synthesis

In this section I present a synthesis of the results, where I further integrate the findings and make some careful extrapolations of them.

5.1 Summary of key insights

Three plausible and coexisting reasons for why TCs did not diffuse as well as some hoped were found in the data. These were 1) particularly physician and patient incompatibility, 2) limited relative advantages for physicians and patients, and 3) high satisfaction in current situation diminished physicians' innovativeness and hence interest and awareness of TCs. Rational reasons were part of each of these and social reasons part of the first. The initial shock of the pandemic influenced all three of these radically and partially permanently. During this several ways in which the various elements (system, innovation, adopters) interacted and influenced each other could be noticed.

The pandemic changed the environment (system) so that the innovation characteristic of relative advantage improved greatly for physicians and patients. This increased rational reasons to adopt the innovation and spread awareness of it quickly. Due to this change and learning through use of the innovation, physician perceptions of TC changed, which decreased social resistance and created some social push to adopt TCs. Much of adopter-innovation interaction happened after adoption, as adopters learned about the innovation through use. Many physicians realized they had assumed certain elements of the patient consultation to be more indispensable than they really were – such as ability to touch – and underestimated certain other elements such as carefully listening to the patient. These realizations were made because the innovation caused medicine to be practiced in a new way, and old assumptions were challenged. This showed that the observability of the innovation's benefits is influenced by the norms of the system. As well as how an innovation may change the norms of the system, as members of the system learn about their practice by using the innovation.

Yet, even after prolonged exposure to the innovation, very contrasting interpretations of TCs were made. In part this was because TC touched areas of medical work where individual preferences and opinions differed considerably. TC was also a novel innovation and data of its long-term effects was lacking, thereby leaving a lot of room speculation. Driven by social reasons such as not wanting to change the status quo, and rational reasons such as concern over potential risk to patients.

Central for differences in interpretation are adopter characteristics and how they interact with the system and the innovation. Some did not adopt certain TCs or abandoned them after experimenting with them because they did not consider the benefits of TC as important as its negatives. This is a rational reason caused by differences in values, preferences, skills, personal situation, or salient goal.

For example, one of the most important benefits to many was how TC fit with their other areas of life. Hence, the relative advantage of the innovation was dependent on the individual's personal situation. Individual preferences also influenced how beneficial certain features of the innovation (e.g., having a visual connection) were considered. Hence, relative advantage was dependent on the innovation fit with adopter characteristics.

A central insight was that a key factor behind the varying evaluations of the innovation were the physicians' differing perceptions of medical care itself, of the role of the physician and the patient. Including their salient goal. These perceptions are developed in the interaction between the social system and the individual. This then determines how certain characteristics of the innovation are evaluated. Hence, it is an example of how the interaction of all three elements (innovation, system, adopter) leads to a decision to adopt or reject an innovation.

This may have also been one of the core reasons for the polarity of opinions since opinion of the TC was dependent on adopter values. Rather than just differing technical evaluations of the innovation's efficiency. Yet, while the strong views regarding TC use could have created strong peer pressure for and particularly against TCs, none of my interviewees experienced peer pressure enough to take notice of and said others around them did not seem to be much affected either. It appeared that generally the physicians' trust in their own occupational experience led them to emphasizing their own opinion over others'. The reasons for adopting or rejecting the innovation was almost always based on personal experience or know-how. So, despite evidence of social pressure, the reasons given for adoption decisions were individual and rational as defined by rational account perspective. One of the reasons for the smaller role of social reasons in adoption was likely also that TCs did not facilitate expertise building. Hence, it did not have the potential for status gains. On the contrary, it took time from more thorough meetings with patients with more complex problems which are important for physician skill development. From the managerial point of view, the diffusion of TCs among physicians may have seemed slow because the innovation characteristics were better for them and aligned with their roles and norms better.

5.2 How the characteristics of the system, the adopters, and the innovation together influenced the teleconsultations' diffusion in Finland

In this section I present the main findings relating to the research question 'How did the characteristics of the system, the adopters, and the innovation together influence teleconsultations' diffusion in Finland?' The figure 6 presents A system-adopter-innovation-fit model of the results. It simplifies the process but facilitates comprehension of the general adoption process and highlights the important factors.

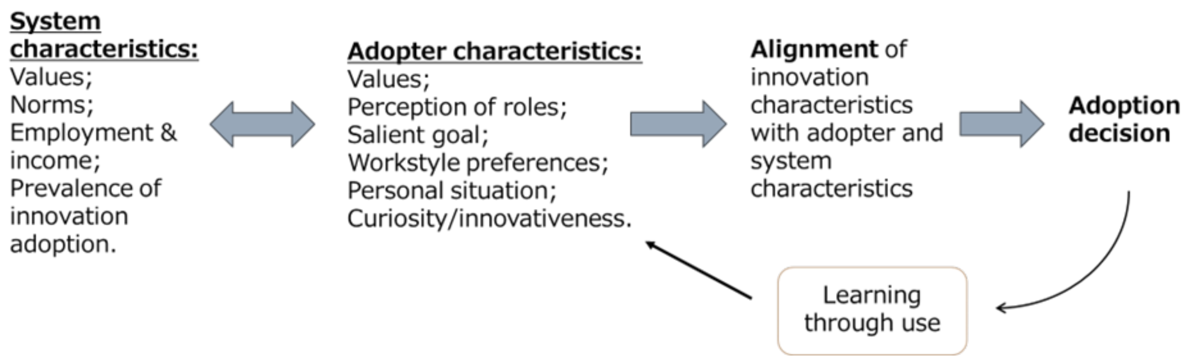

Figure 9: System-adopter-innovation fit model

Features of the system including the pre-existing culture influence how the members of the system perceive their roles, goals and what they value. Features of the system also influence how great the innovation's benefits are and how necessary it is. System characteristics are then of course influenced by the members of the system. How well the innovation aligns with all this determines how its characteristics are evaluated and whether it is adopted or not. After adoption, individuals learn about the innovation, which can change their interpretation of its characteristics such as relative advantage and their compatibility with it. They may for example learn about their own occupation through its use and as it diffuses in the system it may change the system's social norms and gain more benefits through network externalities for example. Table 3 presents in more depth how each of the main factors found here form in the interaction of all three elements.

Table 3: Interaction of all three elements

Finding
Perception of physicians' and patients' role and relationship influence the innovation's perceived advantages relative to alternatives. As well as how compatible they feel with the innovation. (Adopter characteristics <->[5] system values and norms <-> innovation characteristics)
Salient goal influences evaluation of innovation's relative advantage. (Innovation characteristics <-> individual values <-> system norms)
How the importance of different aspects of the work are evaluated influence how the innovation is evaluated. (Innovation characteristics <-> individual values <-> system norms)
Adopter characteristics determined how resource slack or shortage influenced adoption decisions. (Personality characteristics <-> personal situation within system <-> innovation benefits)
How TC fit with the system, and the physicians' other areas of life, the so-called shadow systems was an important determinant of its relative advantage. (The system <-> personal situation <-> innovation's relative advantage)

Physicians' perceptions of the patient and their relationship influenced how they saw TCs. For example, varying opinions on whether or not the patient should have agency in their own care influences the physician's willingness to let the patient have say on how the consultation is conducted. That is, face to face or online. How they perceive their own role also has an impact. For example, does the physician find any increase in risk as acceptable for benefits in access and comfort or not? Answers to questions such as this determine whether providing TC aligns with the physician's values. This is similarly true in regards to physicians' salient goals. Physician seeking to maximize their ability to diagnose the patient in each meeting would be generally against TCs. Whereas a physician seeking to help all potential patients as much as possible would value TCs ability to reach a greater number of patients and reduce their discomforts caused by travel.

Evaluations of the importance of different aspects of work have similarly an impact. For example, perceiving physical presence as instrumental for physician-patient connection makes TCs' feature of not having that connection a greater negative. Thinking lack of physical presence has its benefits causes one to think more positively of TCs. Same thing for adopter characteristics. I in particular found that resource slack provides freedom for curious individuals to sate their curiosity. For less curious individuals it reduces incentives to try out new things.

How the innovation fits with the users' other areas of life is also important. For example, TCs started to be promoted as the option for physicians with families, due to how well they could be fitted to free

[5] The symbol '<->' refers to an interaction between elements.

time or other duties. Some of my findings appeared to be the results of only two factors directly interacting, so I present them in tables 4 and 5. First system-innovation interactions in table 4.

Table 4: System-innovation interaction

Finding
Divergence from the norm may cause it to be difficult to analyze the relative advantages of an innovation. In the conservative culture of healthcare such innovations may easily go ignored. So, in other words, the observability of the innovation’s benefits may be influenced by the norms of the system. (Innovation characteristics <-> System values)
TC’s relative advantages are tied to the number of stakeholder groups that adopt it. (Innovation characteristics <-> stage of diffusion / structure of the system)
Organizational support mitigated the complexity of the innovation.
TC influenced the system by changing how, when, and where physicians could work. (Innovation characteristics <-> system characteristics)
Changes in what is valued within the system may change the relative advantage of the innovation.

An interesting finding regarding innovation and system interaction was that divergence from the norm appeared to make evaluating its relative advantages more difficult. For example, many physicians were surprised that TCs were much more useful than they had expected. They realized medicine could be provided in more ways than just the conventional way.

TCs relative advantages are also tied to the number of stakeholders that adopt it. For TC to become available for patients it must first be adopted by both managers and physicians. Without a large number of customers its benefits to managers, physicians and customers are diminished. Adoption of insurance companies is generally necessary for sufficient patient mass to form. Adoption of insurance companies appears contingent on governmental decisions.

Organizational support also mitigated the complexity of the innovation. By giving demonstrations organizations – which can be seen as smaller social systems within the field – eased adoptions and use of TCs. Pandemic also gave an example of how an outside force can change what is valued within a system and thus change the relative advantages of an innovation. In this case it was the importance of avoiding physical contact. Yet, as the system influences the innovation’s innovation characteristics, so can the innovation influence the system’s characteristics. TCs changed how, when, and where physicians could work. Before physicians had not been able to meet patients outside of their office and start work spontaneously before or after office hours.

Some interactions appeared to be only between adopter and innovation. I present these in table 5.

Table 5: Innovation-adopter interaction

Finding
Curiosity and innovativeness may allow an individual to discover benefits of the innovation that are difficult to observe. (Adopter characteristic <-> Innovation characteristics)
Through use of the innovation user perceptions of it changed. (Adopter characteristics <-> Innovation characteristics)
Preferences regarding method of work influence the relative advantage of an innovation. (Since system influences the innovation's characteristics this could also be seen as three-way interaction) (Adopter characteristics <-> Innovation characteristics)

From this dynamic, I found that curiosity and innovativeness may allow an individual to discover benefits of the innovation that are difficult to observe. Others may require experimentation with the innovation before they realise its benefits. Also sometimes benefits of the innovation differ between adopters simply due to personal preferences regarding workstyle. Some for example did not like chatting by writing and prefer to talk. Or they preferred more complex cases with a longer lasting physician-patient relationship.

5.3 How the social and rational reasons drove the diffusion of teleconsultations in Finland

In this section I present the main findings that relate to the research question 'How did the social and rational reasons drive the diffusion of teleconsultation in Finland?' To answer this, I must also explain what kinds of social and rational reasons existed to facilitate and prevent the diffusion of TC and why these pressures to both ways existed.

Based on the data there was clearly heated public debate and conflicting opinions regarding TCs and their use. Those arguing against TC provision sometimes implied or outright called TC provision unethical. Or some forms of it. The social pressures to not adopt TCs appeared to be the strongest before the pandemic. When the pandemic began, general attitudes turned really positive, but then how widely should TCs be used became a heatedly debated topic. Hence, after the pandemic the social pressure to not adopt was mainly on certain forms of TC provision rather than all TC use. After the pandemic there was also some social pressure to provide TCs as ethical reasons to do so were realized.

Despite evidence of these pressures none of my interviewees or in the public data said it affected their adoption decisions either way. This uninterest in others' opinion was explained by high belief in their own judgement due to belief in their own occupational competence. They also saw the benefit to patients they were delivering through TC provision, so this belief in the value of their work also mitigated the influence of social pressure.

Rational reasons to adopt the innovation were increased as the relative advantage of the innovation increased due to the pandemic and its effects on the system. Through use of the innovation the physicians also realised more of its benefits, so the increased salience of its benefits also facilitated rational account-type evaluation. Before, some of these benefits of the innovation had been hidden, partly because the innovation did not fit certain norms of the system. Through learning some physicians changed their perceptions and the norms of the system thus began to change. Hence, the system became more open to the innovation and social resistance decreased.

Social pressure to not adopt may have been mitigated by the fact that the possible increase in patient risk was only that a dangerous ailment might go unnoticed. TC does not have a risk of directly hurting a patient such as is the risk with new medications and surgical procedures. Hence the risk is only of omission and not of commission. The latter of which is a far more sanctioned type of risk.

Simultaneously, TC did not appear to have potential to provide higher quality of care. Therefore, physicians did not have the possibility of becoming an exemplary user of TCs by adopting it early on. Hence, both negative and positive social pressures were mitigated by the features of the innovation to some degree.

TC is also a technology that was considered to have potential to change the field and the physicians' role drastically. Particularly in the future. Some feared negative consequences to physician skills. Some feared technology would take away their autonomy and position as respected professionals. Others were happy that a technology could substitute them to some degree and thus patients would have better access to care. Hence, whether the focus was on the person themselves or on the patient also influenced openness to adopt potentially revolutionary technology. In figure 7 these factors that influence whether social or rational considerations are emphasized in the adoption-decision process is presented.

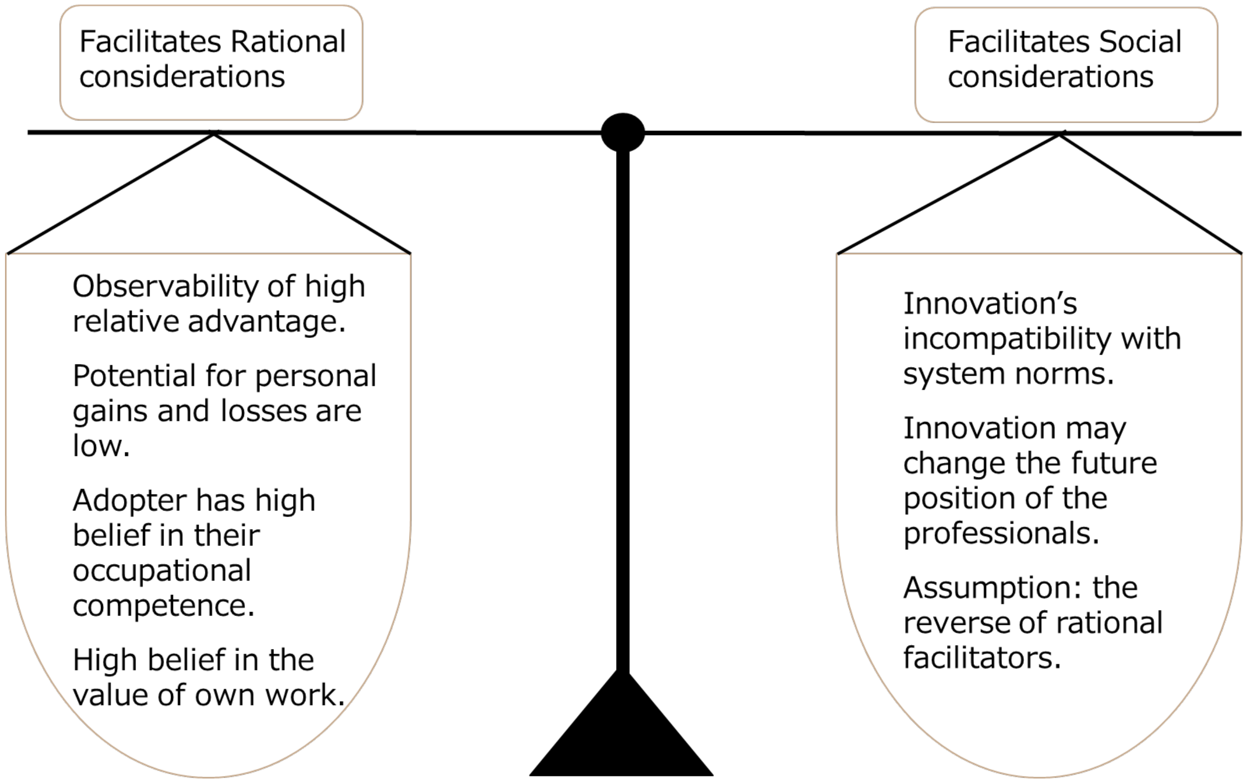

Figure 10: The social versus rational perspective seesaw

In sum, social reasons mainly hindered the diffusion of teleconsultations. This was because TCs were associated with uncomfortable changes in the healthcare field and their use had a potential to increase some patient risks. Yet, the impact of these social reasons to not adopt was mitigated by certain innovation and adopter characteristics. Rational reasons both hindered and facilitated diffusion, depending on how the physician perceived the innovation's risks and benefits.

6 Discussion

The diffusion of innovations literature has two major topics of debate with clear research gaps. Firstly, there is an often-spoken argument that what is important for the diffusion of innovations is not just what individual factors, such as the innovation's, the adopters' or the system's characteristics are present. Rather what determines how the innovation diffuses is how these factors interact with each other. Yet, despite how common this argument is, very little research has been done to understand this interaction. To shed light on this issue was my first goal and thus it formed my first research question. I will discuss my findings regarding this in the first sub-chapter of this discussion.

The second research gap concerns a debate regarding the type of information that potential adopters base their adoption decision on. The information types can be divided into two: Rational and social. The extant literature has various theories regarding the stage of the diffusion process when one information type is more important for diffusion than the other. Yet, the literature does not answer what case-dependent factors such as the innovation's, adopter's, or the system's characteristics influence which of these information types is emphasized more. My second research question was based on this and thus answering it is my second goal. I will discuss it in this chapter's second sub-chapter.

After these first two sub-chapters where I discuss my theoretical contributions, I discuss the practical implications of my thesis, then its limitations and finally my future research proposals in subsequent sub-chapters.

6.1 How perceptions of the innovation form in the interaction of factors

The diffusion literature has a comprehensive list of how various innovation characteristics, adopter characteristics and system characteristics influence the likelihood and rate of diffusion. (Rogers 2003; Greenhalgh et al. 2004; Jeyaraj 2006.) Yet, Greenhalgh et al. (2004) noticed that while many of the innovation characteristics have strong evidence, not one of them is always associated with successful diffusion as assumed. Thus, they concluded that the interplay of these various innovation-, adopter-, and system characteristics must determine their actual influence. This argument is promoted by many (e.g., Wejnert 2002; Fitzgerald 2002; Greenhalgh et al. 2016, 2017a, 2017b; Khodadad-Saryazdi 2021), yet the interaction itself has rarely been studied as focus has remained on the individual factors (Cannavacciuolo 2023).

The major contribution of this study is that I found several ways in which each of the three main elements: system, adopter, and the innovation influenced each other and how this interaction influenced adoption decisions and hence diffusion of teleconsultations. Due to this interaction potential adopters formed very contrasting evaluations of the same innovations despite similar levels of information of the innovations. Thus, my results provide additional evidence in support of the argument (e.g., Greenhalgh et al. 2004) that rather than individual factors, the interaction of the system, adopter and innovation is central in deciding how the innovation diffuses. And contributes to the literature by presenting several specific ways in which this interaction influences the diffusion process.

The most fundamental example of interaction between system, adopter, and innovation that I found was how physicians' perceptions of their professional role, values, and salient goals shaped their interpretation of the innovation's relative advantage. Whether a feature of the innovation was seen as beneficial depended on these perceptions. For instance, the ability for patients to decide how and where the consultation takes place was interpreted as either good or bad, depending on how the physician perceived the patient and the care relationship. This illustrates that examining innovation features in isolation cannot yield a reliable understanding of diffusion, since their meaning depends on the wider constellation of system and adopter factors the innovation interacts with.

My study therefore contributes to the diffusion literature by showing that research should move beyond the focus on innovation characteristics—or other single factors, as much prior work has done (Cannavacciuolo 2023)—to examining how interacting constellations of factors shape the interpretation of innovations. Some prior research has noted that values, past practices, and individual goals influence adoption decisions (Denis et al. 2002; Fitzgerald et al. 2002; Adler & Kwon 2013). My findings extend this line of research by showing that the adopters' perceptions of their professional role and relationship with customers can influence how they evaluate an innovation's relative advantage.

This touches on a recent change in healthcare delivery models. In traditional models of healthcare delivery, the patient has a passive role. The physician decides what the patient needs and acts accordingly. In shared decision-making models the patient has a more active role and is encouraged to express their treatment preferences. The shared decision model has been promoted lately due to evidence of its positive effects on patient outcomes. (Ellins & Goulding 2005.) Here I found that this traditional perception of healthcare delivery and of the physicians' and patients' roles may reduce a physician's willingness to adopt innovations like TC as in doing so they give the patient a more decisive role. Whereas for those who believe in shared decision-making models, allowing the patient to choose between TCs and traditional consultations is a way to take the patients preferences better into consideration.

This is an interesting finding also because telecommunication technologies have been considered to hinder shared decision making along with other forms of patient centered care, due to difficulties in communication (Keshet et al. 2024). Yet, allowing the patient the option between different meeting modalities is by itself shared decision making. Many also found they learned to be better communicators by using TCs. Though they also noted TC is not for long term care alone due to its limits. So TCs may hinder certain aspects of patient centered care but also facilitate other aspects of it. Once again depending on the context and how TC is perceived and used.

I also had novel findings which should contribute to our understanding of early adopter behaviour. I found that adoption of teleconsultations can occur even before evidence of technical or social relative advantages is available. In this case I found adoption to be driven by curiosity and the belief that teleconsultations might be useful to patients. This willingness to experiment seemed to require both financial slack, which made potential setbacks to income acceptable, and strong trust in their own occupational competence, which provided confidence to act on curiosity. This combination of factors allowed adoption without the expectation of becoming an exemplary user or evidence of clear technical or social advantages, in contrast to the findings of Compagni et al. (2015). Additionally, Financial slack facilitated early adoption only if the individual was also curious about the innovation. Otherwise, it reduced the physicians' need to innovate.

Though what I referred to as curiosity, could possibly also be called innovativeness since the interviewee's comments align with the items Agarwal and Prasad (1998) used to test for personal innovativeness in the information technology domain. My findings support the extant literature in that this curiosity or innovativeness is particularly important for early adoption of innovations (Agarwal & Prasad 1998) yet adds that innovativeness by itself is likely not enough but requires also financial slack. Hence the innovation configuration – which Fichman (2004, 320) uses to refer to a set of factors that lead to a certain innovation related outcome – that leads to adoption of the innovation in absence of clear evidence of the innovation's relative advantages and social reasons to adopt consists of at least innovativeness and financial slack.

Besides belief in occupational competence and financial slack, greater risk tolerance could also allow an individual to follow through on their curiosity or desires in general. Accordingly, I did note willingness to accept some risk as one trait facilitating continued TC adoption. This appears to be a general finding and not just in regard to TCs because innovativeness has been linked to greater acceptance of risk (Agarwal & Prasad 1998; Darban & Polites 2020) and that risk-averse individuals and groups avoid uncertain innovations (Leidner & Kayworth 2006). My findings could be interpreted to support the argument that willingness to accept risk facilitates innovation adoptions. However, as I said before, it could also be explained by differences in what aspects of medical outcomes the physicians valued, and how they perceived the physician-patient relationship.

I found that if the system's norms do not align with the innovation, it may be more difficult to perceive its benefits. Meaning observability of the innovation's benefits are influenced by its compatibility with the system's social norms. Powell & DiMaggio's (1983) argue that the more ambiguous the information regarding an innovation is, the greater is the importance of subjective information from colleagues and other contacts. Reflecting on this, my finding would also mean that when innovation is less compatible with system norms, adoption decisions would be based more on subjective peer information, which in this case would lead to less diffusion, as the opinions would be more negative due to the misalignment with general norms.

As was with TCs in my study, social norms may also take time to change to be accepting of the innovation if it does not initially align with them. Hence, from my finding can also be concluded that innovativeness is particularly important to innovations that do not align with social norms as the misalignment makes the innovation incompatible with adopters and can also hide some of its relative advantages. To find the real value of the innovation it may require personal experimentation to learn of all the benefits as was with the case of TC for many.

I also found that TCs and particularly the chat modality benefits from a greater number of adopters. Meaning they have network externalities. That is, its benefits to users – both providing physicians and patients – increase as more physicians and patients use it. Which is common for IT innovations (Fichman 2004) and had been argued to be important for telehealth innovations in general as well (Cho et al. 2009). My study provided support for this argument and that it was also the case for TCs specifically. That they were lacking the necessary size of the network of providers and consumers to bring out all the benefits prior to the pandemic. For these unconventional innovations with network externalities the importance of innovative individuals with financial slack is heightened as they are needed to facilitate early diffusion to reach the greater benefits through network externalities later on. Which may be required for the innovation to have positive relative advantages for the average adopter as appeared to be with TCs.

While there is a lot of literature regarding the importance of innovation's compatibility with the adopters' values, needs, and past experiences as well as some literature on the importance of innovation and system fit (e.g., Rogers 2003), the literature regarding the importance of the innovation's fit with adopters' 'shadow systems'– that is, life outside work – is scarce. Plsek and Greenhalgh's (2001) comment on the importance of this, but I have not come across studies where this fit was empirically found as important for how the innovation's relative advantage was evaluated. That TCs' alignment with physicians' shadow systems was TCs' key selling point for physicians with families.

My additional finding that preferences regarding the method of work influence the perceived relative advantage of an innovation supports the extant literature. Though generally this is discussed as innovation's compatibility with preferred work style (Karahanna et al. 2006).

In my study the innovation's complexity was generally considered low and not a barrier to use. This is in contrast to some studies (e.g., Greenahlgh et al. 2017b). One factor that mitigated this as a barrier was strong organizational support. Which has been found to be among the most important individual factors to facilitate innovation implementations (Jeyaraj et al. 2006) and has also been found lacking in some earlier telehealth implementations, thereby hindering adoption (Goenka et al. 2020). Though the form of TC that spread in the Finnish private healthcare is also a very simple form from organization perspective and does not require similar teamworking efforts as some other telemedicine implementations and hence may not be entirely comparable.

While the form of TC may have been simple, it still influenced the system greatly by changing how, when, and where physicians could work. Thereby being a clear example of how the innovation is not only adapted to the system, but the system can also adapt to the innovation (Khodadad-Saryazdi 2021).

All in all, I contributed to the diffusion literature by finding numerous novel ways in which this interaction between the three elements of system, innovation, and adopter happened and influenced each other and the outcome of adoption decisions and diffusion. By describing these interactions, I increased our understanding of the diffusion process and showed that focusing on singular factors in isolation is not enough to form a complete understanding of diffusion. Next, I will discuss the roles social and rational considerations had for the diffusion process of TCs.

6.2 The role of social and rational drivers in the diffusion process

Some researchers explain all diffusion through rational reasons (e.g., Banerjee 1992; Bikchandani et al. 1992, 1998) while others have pursued social explanations (e.g., Meyer & Rowan 1977; Abrahamson 1991). In current management research the social approach has become clearly dominant (Naumovska et al. 2021). Some such as Ansari et al. (2010) and Tolbert and Zucker (1996) have proposed they are both important but vary in their impact on diffusion depending on the circumstances. Earlier arguments proposed that early diffusion is due to rational evaluation of the innovation's benefits and later adoption due to fears of being left behind (Abrahamson & Rosenkopf 1990, 1993; Westphal & Zajac 1994). Then Kennedy and Fiss (2009) and Lounsbury (2007) found these motivations can coexist simultaneously. The new argument was that what separated early and late adopters was that early adopters adopted more for the opportunity for status gains the innovation provided while later adopters adopted due to defensive reasons trying to maintain their position (Kraatz & Zajac 1996; Kennedy & Fiss 2009).

My findings diverge from these perspectives in important ways. First, status concerns did not appear to be an important driver of diffusion at any stage. Neither defensive reasons nor status gain related. This was likely because teleconsultations as an innovation did not increase medical quality. Hence, they did not provide the chance to become an exemplary user which Compagni et al. (2015) believed central for the earliest adopters to adopt an innovation. Similarly, others also do not generally risk deteriorating their status by being left behind in their medical skills if they do not adopt the innovation. Ergo, my study illustrates that the prior frameworks were incomplete for understanding the diffusion of innovations such as TCs, that do not provide the chance to become an exemplary user. In my data, this motivation was replaced by simple curiosity and belief it might help patients get easy access to care if TCs proved functional.

My results that TC's diffusion among physicians appeared to be mainly driven by rational individual decision-making aligns with the literature as it claims that users are more likely to adopt for individual reasons (Greve 2011). As well as in that in my data those who abandoned some types of TCs after adoption appeared to do so with ease. Which is common for adoption decisions made due to rational reasons (Bikchandani et al. 1992; Greve 2011) after the individual gains new information. Yet, it is not common when the adoption decision was done for social reasons (Tolbert & Zucker 1996). Hence, my study provided additional support for these arguments.

My results implied that high belief in own occupational competence increases individual rational decision-making and uncertainties regarding own occupational competency does the opposite causing the individual to follow the herd. This is a novel contribution in its specificity regarding the effects an individual's level of belief in their occupational competence has on their herding behavior. I believe this belief in own occupational competence relates to the concept of self-efficacy, particularly to one of its constituting parts, called the experience of prior accomplishments, (Bandura 1977). Self-efficacy has been linked to willingness to try out innovations (Strong et al. 2006) and seek out new experiences (Tsang 2001). While lower self-efficacy has been linked to greater imitative behaviour (Argyris & Xu 2016). Yet, contrary to their expectations Darban and Polites (2020) did not find self-efficacy to reduce imitative behaviour but increase it instead under conditions of uncertainty regarding the innovation. To explain this, they proposed it might be the inherent optimism and belief in their ability to control their future that caused the surprising finding. If not due to the characteristics of their focal innovation. Thus, they continued that when studying the effects of self-efficacy on imitative behaviour the concept should be split into its constituting parts to better see which factors in the concept influence adoptive behaviour.

Based on my results I cannot say how innate optimism influences imitative behaviour, but I can make the novel argument that belief in own occupational competence gained through experience – which closely resembles experience of prior accomplishments – decrease imitative behaviour. This aligns with Darban and Polites' (2020) proposition since belief in own expertise gained through experience is not a personality trait that comes with inherent optimism. Further support is provided by Chen et al.'s (2011) finding that less experienced consumers imitate others in online shopping purchases.

In regard to more inherent individual characteristics, as mentioned in the previous chapter I found curiosity or innovativeness as one cause of early adoption when the innovation does not provide status or financial gain potential. Yet, this finding is also relevant for the discussion regarding social and rational drivers of diffusion. Innovativeness has been linked to individual adoption decision-making (Agarwal & Prasad 1998; Rogers 2003; San Martin & Herrero 2012). Similarly, when one adopts before others have adopted due to curiosity, they are making an individual adoption decision rather than following a herd. It is also not based on social reasons, and hence adopting due to curiosity is an individual rational adoption decision. Since besides curiosity the potential adopter may need belief in their occupational competence and financial slack to follow through, this constellation of factors is related to individual rational adoption decisions as a whole.

In alignment with Powell and DiMaggio's (1983) arguments I found that the increased salience of the relative advantages of the innovation appeared to facilitate rational evaluations. I also noted a similar finding in the opposite direction that if the innovation may change future positions of adopters, then social considerations are emphasized. In sum, greater rational reasons to adopt seem to increase the weight of rational considerations in the adoption-decision process and vice versa. This aligns with common sense, but I have not noted it to have been explicitly stated in prior literature.

I also had one final finding not addressed in the diffusion literature. That is, my results indicate that when an individual believes they are working for a good cause by adopting an innovation, they can more easily follow their own beliefs rather than others. Believing they are doing good gives a justification for their decision to adopt the innovation. Hence others' opinions are likely to be less important as there is no need for external justification. Thus, this finding contributes to the literature which is trying to understand what factors influence whether adoption decisions are based on social or rational drivers. I could not find any mention of a similar finding or proposition in the diffusion literature causing me to conclude it is a novel finding for the diffusion literature stream. In the literature of entrepreneurial innovativeness Kim and Beehr (2023) had however made a supporting finding that experiencing one's work as meaningful facilitates entrepreneurial behavior such as innovativeness and risk taking. Which as mentioned above facilitates innovation adoptions.

6.3 Practical implications

Based on my findings several practical implications can be drawn. First, managers and policymakers should recognize how the interaction of different configurations of factors influence operational users' – such as physicians' – adoption decisions. The features of the innovation should not be assumed to be interpreted and valued the same way from one individual to the next. Managers should understand what is behind those differing interpretations so they can have some ability to manage them. This understanding is essential because healthcare organizations in Finland and worldwide face increasing pressure to innovate and adapt to the challenges posed by aging populations (Haanperä & Nyström 2020). Lack of understanding can cause useful innovations to never become diffused in the system, and their benefits remain unclaimed.

Second, managers should pay attention to the potential gap between organizational and individual adoption. My findings show that this is particularly important when the innovation they are thinking of implementing challenges pre-existing professional norms as teleconsultations do. The reason is managers often use different information from users of the innovation to make their adoption decisions (Lanzolla & Suarez 2012). This can cause organizations to adopt innovations that are not consequently adopted and used by employees. This creates costly adoption-use divides (Wang 2009) which were visible in my data as well.

This is especially important in highly professional fields such as healthcare, where professionals tend to rely on their own expertise rather than managerial opinions (Mclaughlin & Kaluzny 1990). My findings align with earlier research (Adler & Kwon 2013) suggesting that professionals are less likely to adopt such nonconforming innovations, thereby creating potential adoption-use divides and hindering diffusion.

This is particularly problematic, as so-called disrupting innovations that can transform the industry if given a chance to develop, diverge from the norm by definition. Telemedicine is considered one such innovation (Christensen et al. 2009.) and based on my data it also had a considerable adoption-use divide prior to the pandemic. This potential of telemedicine is also what caused many managers and policy makers to be so excited about telemedicines. This may have increased the divide in perceptions between managers and physicians as sometimes when an innovation's relative advantage is perceived as high, the uncertainties regarding it are discounted (Chen et al. 2015; Darban & Polites 2020). Physicians look at TCs from a different perspective and hence likely did not perceive their relative advantages as high as managers did. Instead paying more attention to the uncertainties regarding the TCs' medical quality (e.g., McCartney 2012). This divide in perceptions is likely one reason the literature on TM diffusion is filled with failed implementation attempts prior to the Covid-19 pandemic (Khodadad-Saryazdi 2021).

The third practical implication is that in order to better understand physicians' perceptions and thus avoid adoption-use divides managers should pay close attention to the items I listed in tables 3, 4, and 5 which I found central in determining how physicians evaluated the innovation. By understanding physicians' perceptions regarding these items, managers can better understand the basis for physicians' attitudes regarding the innovation. So, for example, by understanding how a physician perceives their work, patients, and goals the manager can understand why the physician likes or dislikes certain features of the innovation. Then they can try to adapt the innovation to these preferences and values or promote a narrative of the innovation that aligns with the physicians' values and preferences. For instance, if an organization wants to scale TC use, managers could emphasize how teleconsultations help patients who might not otherwise go and access healthcare services due to transportation costs. For managers in other industries the same logic applies, though the constellations of factors to watch may be slightly different. So before implementing an innovation managers should understand how the operational users perceive the innovation and what constellation of factors are behind those perceptions. This is particularly important when the innovation diverges from previous norms.

As a final note, I also made one specific insight for governmental policy. My results indicate that the Social Insurance Institute's (SII/Kela) reimbursement of phone should align more closely with video rather than with chat as it currently does. Phone was consistently considered to be very similar to video, both in medical quality and the time and effort spent by the physician. These were the two standards based on which the physician union recommended the government to change their reimbursements earlier on (Lääkäriliitto 2023). A recommendation which the government followed. Since those two factors are the basis for the level of reimbursement the reimbursement of phone should be closer to video than phone based on my findings.

6.4 Limitations

Interviews always come with certain disadvantages along with their advantages. While they can be rich in data, and allow flexibility among other benefits, they can be open to bias from either the interviewee or interviewer and hence be somewhat unreliable as data sources. (Brewerton & Millward 2001, 81.) The interviewees may have for example been influenced by peer pressure more than they realized. This is a phenomenon known to happen among physicians (Beran 2015) and could have caused biased results regarding the balance of rational and social drivers in their adoption-decision process. Interviews also are time consuming, limiting the possible sample size and the sample might be skewed one way or another due to access issues. (Brewerton & Millward 2001, 81.) I, for example did not get to hear directly from those who never adopted any TCs. And I only heard of physicians being bothered by the polarity surrounding the issue of teleconsultations from the public data. Hence, I know I did not hear from all perspectives in my interviews, though while conducting them I felt they had started to saturate.

Some of the interviewees may have felt the need to speak well of the way their organization handles their TC services. This may have skewed the data to some degree, even though anonymity was promised, and safety of TC was not a focal point of the study.

Hence, a greater number of interviews might have improved the reliability of my results, and the sample was in part limited due to the difficulty of acquiring interviewees. Yet, as I discussed in more depth in the methodology section, I feel I gained an adequate sample for my goals as I sensed saturation.

To improve the reliability of my data and analysis I triangulated the physician interviews with public data and KEMUT data. The public data complemented the interviews well as it allowed me to have access to far more perspectives than I could have gotten with interviews alone. The public data's limitation was that it did not provide similar in-depth back and forth conversation as interview data does and hence interviews complemented it well also. The KEMUT data was beneficial in allowing me to understand the managerial point of view. The triangulation approach is strongly recommended by Yin (2014) for robust case studies. I also know that had I lacked any one of the data sources my results would have looked different. So, I strongly believe that having all three types of data sources made my data far more reliable than only using one or two sources but with greater sample sizes.

So that the reader need not blindly trust in my analysis skills, but can make their own conclusions with in-depth information, I followed the advice of Eskola and Suoranta (1998, 167) and tried to clearly explain each step in my data collection and analysis process. This as well as strictly following case study protocol after adapting it to my research needs should have increased the reliability of my study (Koskinen et al. 2005, 258; Yin 2014, 48-49).

6.5 Future research

My study was exploratory in essence, so many of my findings would benefit from further testing. Particularly interesting to me was that my findings suggest there is less herding in fields where work is found to be more meaningful. As mentioned, I could not find any prior work on this topic, so further inquiry into it is warranted to find out if it holds true in quantitative studies. Similarly, will quantitative studies repeat my finding that high belief in occupational competence gained through experience influences herding. How strong is its relationship with general confidence? Is confidence earned via experience more likely to facilitate individual rational decision making, than innate confidence that more optimistic individuals naturally have? Which Darban and Polites (2020) proposed, and my findings gave some support to. Is the effect of individual resource slack on innovation positive or negative depending on the innovativeness of the individual as my results imply. Future research could also test if my finding that greater rational reasons to adopt increases the weight of rational considerations in the adoption-decision process and vice versa is correct.

Besides opportunities for quantitatively testing my findings, I also noted interesting avenues for new research that did not touch my research questions directly. For example, I noticed that teleconsultations might provide lots of data for studying abandonment. Which is a far less studied sub-topic of diffusion (Greenhalgh et al. 2004). TCs diffusion provided material on this, as many quit providing certain TCs after trying them out during the pandemic. Both the public data and the interviews had examples of abandonments.

A similarly interesting observation was that the quality control of TC's and chat in particular seem to have led to increased organizational control. Speziale (2015) found this to be a desirable trend, but Peppin (2000) and Toenjes (2002) are concerned that business motives will drive patient care more and more as organizational control increases. They fear the asymmetry of information between doctor and patient might start to be exploited, when it is currently still prohibited by medical ethics (Arrow 1963). The organizational control mentioned in this study was only intended to ensure patient safety through the development of constraints and handbook recommendations. Hence, in my data organization control did not influence medicine in the way Peppin (2000) and Toenjes (2002) feared. Nevertheless, the increasing organizational steering in Finnish private health care could be an interesting area for future research.

Additionally, my research data hinted that the meeting context in TC may give the physician less of a dominant position relative to the patient. This might be an interesting research subject for researchers with a more post-modern or critical orientation to wonder, and study if such status quo concerns might be one factor hindering TC diffusion among some physicians. Another possibility I perceive is that behind some of the differing perceptions regarding physician-patient relationship and differences in central goals may in part be the physician's need for control. Because the shared decision-making model, allowing patients to choose the meeting modality, and being fine with only helping the patient require a willingness for looser control than fixing the patient and making all decisions by themselves. It would be interesting if this was tested in a quantitative study.

Recent literature has increasingly paid attention to how innovations fit the systems they enter and how the system and adopters adapt the innovation to fit better. As well as how the adopters in turn adapt to fit better with the innovation. (e.g., Khodad-Saryazdi 2021.) Including adaptation after adoption (Naumovska et al. 2021). Many terms are used of this adaptation process such as translation, editing, transposition, creolization, and reinvention (Rogers 2003; Ansari et al. 2010; Adler & Kwon 2013). This is an interesting line of research in that it studies how the three variables of innovation, adopters, and the system interact and change each other.

The spread of teleconsultations could provide potential insights regarding practice variation, as the way they were provided varied and developed over time. For example, the attitudes regarding where and how it was okay to provide chat became more lax. Before the pandemic, providing TCs from a vacation home was said to be not acceptable, but later on providing them in this manner became a selling point for physicians to adopt them. How organizations set them up also influenced their attractiveness. As physicians became more accustomed to chat they also got faster with them, so that they became financially beneficial while early on they were not. In part this was also because the technology developed and also gained the benefits of network externalities. Hence, multiple aspects changed to cause variation in the way the technology was used. Attitudes and norms changed, the structure of the providing system changed as more adopted and network externalities appeared, simultaneously changing benefits and costs to physicians. This could provide data to analyze how practice variation happens.

Finally, the literature is uncertain how institutional pressures to adopt the innovation maintain their strength throughout the diffusion process. How learning about the innovation through experience influences these pressures. (Naumovska et al. 2021.) The diffusion of TCs was greatly influenced by physicians' learning of the innovation during the pandemic. Hence, I believe answers to these questions could be found by studying TCs' diffusion during the pandemic further.

7 Conclusion

In this thesis, I tried to improve our understanding of how various factors that influence the diffusion of innovations interact and influence the diffusion process (focus of RQ 1). I also tried to understand how rational and social drivers of diffusion influenced the diffusion process and why (focus of RQ 2).

One of my major contributions was that I found several novel ways in which system characteristics, adopters, and the innovation interacted to influence diffusion. Thereby enhancing our understanding of this important yet scarcely studied aspect of diffusion theory. Specific findings insightful for both theory and practice were how the physicians' evaluations of the innovation were shaped by their perceptions of professional and patient roles, their salient goals, work practices, as well as by how the innovation aligned with their "shadow systems". I also found that the observability of an innovations relative advantage can be constrained by system norms. Meaning innovations that diverge from the norm may fail to diffuse because some of their benefits remain hidden. This is of particular importance for the healthcare field in practice, because the field is under great pressure to innovate and the most transformative innovations often diverge from the norm.

Another major contribution was that I showed our prior frameworks regarding the roles of social and rational drivers in diffusion of innovations were incomplete. I found that the characteristics of the innovation influence the impact and importance of social drivers of diffusion.

I also discovered that greater relative advantages and their observability increases the emphasis of rational considerations. As does strong belief in the adopter's own occupational competence and in the value of their work. In contrast, if the innovation is incompatible with system norms, and hence the observability of its benefits is lower, then social considerations can become emphasized. Also, if there is great potential for personal gain or risk, then adopters likely emphasize social considerations. These insights can help managers to understand physicians' adoption decisions better and thus reduce adoption-use divides.

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Appendices

Appendix 1 Interviewee information

H1: She adopted chat, video, and phone early on during the pandemic as she noticed the need for them. She had been aware of them before but had felt contend with only providing traditional consultations. After trying them out, she found TCs very convenient for both herself and her patients and thus continued adoption after pandemic.

H2: He adopted phone and video pre-pandemic and closely followed how chat worked for his specialty as developing TCs for his specialty was part of his organizational role. Sustained use of video and phone alongside traditional consultations because he found the combination to be the most beneficial for his patients. Did not adopt chat, as he wanted to focus on more complex patient cases.

H3: He adopted chat well before the pandemic, because he was curious and thought it might be beneficial to patients. He sustained adoption of chat until many others joined, because he enjoyed being part of the group even though early on it did not hold clear benefits. He abandoned chat at the end of pandemic because the initial user group became lost within the great number of new adopters. He adopted phone during the pandemic and sustained adoption. He did not adopt video consultations, because he thought they had few benefits relative to phone but had the downside of having to be visually present.

H4: She adopted phone during the pandemic, after many colleagues had adopted previously. She adopted because she did not wish to be left behind colleagues. She had not adopted before as she had only done traditional consultations so long that she had gotten routinized. She had also felt uncertain about asking for the technology to be set up for her. After adoption she realized the phone was pleasant as she did not need to feel self-conscious about her looks. Thus, she switched to providing only phone and no traditional consultations or other TC modalities. The chat had the same benefit of no visual connection, but she felt it was a little too limited in what could be done with it, and she also did not feel she had the necessary speed and skills to use it well.

H5: She adopted chat and phone during the pandemic and sustained phone adoption afterward. Did not adopt video, because she thought it had few benefits relative to phone, but disliked the visual presence of video. She abandoned chat after the pandemic, because she was uncomfortable with its potential risks. She had initially tried out chat before pandemic but had not liked it then.

H6: He adopted video and phone consultations during the pandemic and provides them dynamically from his office along with traditional consultations. Specialized in occupational health care. Did not adopt chat, because did not care for the workstyle and did not have a need for it.

Appendix 2 Explanation of the use of AI

When writing this thesis, I occasionally used ChatGPT as a support tool when shortening or clarifying certain phrases or paragraphs I had already written. I never used text that was originally created by AI, so all arguments, analysis, and interpretations in this thesis are my own. The paragraphs I consulted AI for are also very few.

The specific version I used was OpenAI ChatGPT, August 7th version (GPT-5). I used GPT-5 in the editing phase. I used it for advice on how to write some of my phrases in a more succinct manner and check whether they were grammatically correct. A general prompt example would be "Are there more succinct ways to say this: *insert a phrase*". Once GPT-5 answered I would then evaluate whether the answer contained something useful. The general benefit of this was that I could more quickly notice if I had used unnecessary words which I should remove than if I scanned the text alone.

When asking about grammar a specific prompt I used was "Is this sentence grammatically correct: In the light of this information, I discuss the characteristics of the field of healthcare". This type of question was useful in that I could gain some additional certainty I had written in a grammatically correct manner. I did not use AI to gain factual information about my research topic or about doing research in general. Thus, I had no need to verify any such information.