FROM PROJECT TO PRACTICE

Creating conditions for digital healthcare implementation using the CFIR framework

David Adjei & Stina Nilsson
Abstract

Despite the phenomenal innovations and huge investments in healthcare, it is evident that some digital transformation innovations in the healthcare context fail to meet their desired outcomes. Whilst some researchers argue that this is partly due to ineffective implementation, others argue otherwise. Essentially, there is an outspoken need to evaluate implementation processes, and one way to do so is through the use of an implementation framework, where one such framework showing great potential is the Consolidated Framework for Implementation Research (CFIR). By using a qualitative case study through the lenses of the CFIR, the study carries out a summative evaluation and examination of a previously conducted implementation process in a region in the north of Sweden, with the purpose of developing a greater understanding of implementation processes in order to improve patient care, as well as experiences and outcomes of digital transformation implementations. The study successfully identifies factors of both success and challenge in relation to implementation processes, where some of the success factors include the involvement of caregivers in the process and competition of private healthcare providers, whilst some of the challenges include deficient involvement of end-users as well as lack of structure. The study unearths some lessons which can be used as a guide for future implementations within the healthcare context, but also other contexts as well.

Keywords: Digital transformation, implementation, implementation frameworks, the Consolidated Framework for Implementation Research (CFIR), digital healthcare

1. Introduction

1.1 Background

Digital transformation implementation refers to the ways and processes by which digital interventions are planned and executed to meet the needs of end-users (Durlak & DuPre, 2008; Durlak, 2016). Throughout the world, most digital transformation interventions are unsuccessful despite the huge investments and phenomenal innovations in digital technologies, and the healthcare context is not an exception (Damschroder et al., 2009). For example, €21 billion was used in the National Programme for Information Technology (NPfIT) in England and $27 billion was spent in the Meaningful Use of Electronic Health Records program in the United States of America (Blumenthal & Tavenner, 2010; Burton-Jones et al., 2019; Greenhalgh et al., 2011). Yet, these digital intervention programs had their own challenges. In the year 2020, global healthcare expenditure was estimated at a stunning $8.7 trillion (Deloitte, 2018). Amongst others, the reasons for the failure of digital transformation interventions include ineffective communication before, during, and after the implementation of the intervention, inadequate resources and inadequate knowledge of the intervention (Ajami & Bagheri-Tadi, 2013; Ford et al., 2006; Loomis et al., 2002; Ludwick et al., 2009; Meinert, 2005). In the midst of these challenges, one major problem
still remains – the urgent need to improve the outcomes of patient care through digital transformation interventions whilst minimizing costs of operations (Gopal et al., 2019).

1.2 Area of concern
Digital transformation implementation is described as the planning and executing of digital interventions in order to improve an organization’s productivity and effectiveness and simultaneously meet the needs of end-users by the use of technology (Vial, 2019; Durlak, 2016). In order to continuously improve and streamline the processes within organizations, implementation is therefore required. In spite of this, there is demonstrably a lack of knowledge on how to successfully conduct an implementation of an intervention in organizations (Durlak, 2016). Research in health services namely shows that a larger number of digitally related implementations are not able to convert their well-meaning objectives into significant patient care outcomes (Damschroder et al., 2009; Ford et al., 2017; Haggerty, 2017; Machado et al., 2019; Tuzii, 2017). In fact, two-thirds of organization’s efforts to implement changes fail (Burnes, 2004; Damschroder et al., 2009). It is therefore clear that understanding factors of both challenge and success is imperative to bring about future success. So, could there be further challenges related to implementation that have not been shown in previous research? And in relation to that, what are the factors of success related to implementation? In view of this, it is apparent that there is a clarion call to evaluate implementation processes of digital transformation interventions, more importantly, implementation outcomes, in order to prolong sustainability and promote efficiency and in turn increase the success of implementations in healthcare.

1.3 Purpose and research questions
Based on the area of concern, in order to facilitate and succeed with digital transformation implementation processes, there is an outspoken need and interest for more research and understanding of implementations. The purpose of the study is thus to shed more light on the complexities of implementation processes, and to develop a greater understanding of implementation processes to improve patient care, as well as experiences and outcomes of digital transformation implementations. Based on the research purpose, the research questions are as follows:

1. What are the success factors in implementations of digital healthcare intervention projects?
2. What are the challenges in implementations of digital healthcare intervention projects?

The most obvious consequences of not addressing the research questions above is that the risk of failure for implementation processes would continue to be high. For digital transformation in general, this means that the risk of money spent in vain would increase. More specifically, for digital transformation within the healthcare context, it also means an increased risk of not being able to deliver crucial healthcare to patients.
1.3 Thesis disposition

The rest of the thesis is structured as follows: it starts by delving into the related research and theoretical framing. This is followed by research methodology where the design of the study is presented. In the following section, analysis and results, the result of the gathered data material will be presented, followed by the discussion where the insights from the analysis and result will be compared to the findings in the related research. Finally, the conclusion will be presented, including contributions of the study, as well as proposals for further research.

2. Related research and theoretical framing

In the following section, the related research and theoretical framing will be presented. First, digital transformation in society at large will be introduced, followed by digital transformation in healthcare, and implementation of digital transformation in healthcare, including factors of success and challenge. Finally, the section of implementation frameworks will be presented.

2.1 Digital transformation in society

According to Roth (2019), digital transformation is a shift from an analog to a digital age. To Vial (2019, p. 118), 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”. Today, digital transformation is a commonly used buzzword in business, engineering, government, healthcare, as well as society as a whole. It has now been recognized that technology showcases transformation processes in organizations through the introduction of information and business processes (Machado et al., 2019).

The term basically refers to the use of any form of technology to help an organization or business to be more productive, efficient and effective in its operations. For example, it could be adoption and use of software and tools like enterprise resource planning, robotics, blockchain, artificial intelligence, internet of things, etc. Whilst some organizations see it as the development and implementation of a particular technology, others see it as the adoption of new technologies in operations (Machado et al., 2019; Roth, 2019).

Historically, there is no specific date that marks the origin of digital transformation; however, scholars have linked its origin to the 1980’s when rudimentary technologies like spreadsheets were largely used to improve business operations. In the millennium, a lot of technologies have exploded to help advance the course of businesses, so, essentially the term digital technology is an umbrella term for all these outbreaks of technologies. It is mainly a tool that improves business operations (Damschroder et al., 2009; Ford et al., 2017; Haggerty, 2017; Machado et al., 2019; Tuzii, 2017). Digital transformation has impacted a numerous number of fields and contexts, and one context in society that has been greatly impacted by digital transformation is the healthcare context (Ford et al., 2017).
2.2 Digital transformation in healthcare

The adoption of information technology has impacted healthcare since the mid 20th century (Ford et al., 2017). The improvement and transition in healthcare companies as a result of the introduction of technologies is evident within the past twenty years (Tuzii, 2017). Digital transformation in healthcare is the implementation of novel technologies that allows safer and high-quality care (Haggerty, 2017).

Within the healthcare industry, there are a lot of challenges with respect to digital transformation, for instance, there are challenges with regards to the absence of collaboration among stakeholders, inadequate health system interoperability for patient information exchange, real-time medical data sharing within the network of healthcare workers, among others. However, digital transformation emerged to enhance precision medicine. The emergence of fair data, that is, data that is findable, accessible, interoperable, and re-usable, speeds up diagnosis and patient care. In fact, without fair data, digital transformation will struggle. In addition, wearable technology transforms patients’ engagement with caregivers. Big data is applied within the research and development spectrum (Damschroder et al., 2009; Ford et al., 2017; Haggerty, 2017; Machado et al., 2019).

In Sweden, access to digital healthcare has increased from the year 2014 (Cederberg et al., 2018; 2019; 2020). This is partly because the government of Sweden has set an impressive goal to become the best provider of digital health around the globe (Regeringskansliet, 2016; Socialstyrelsen, 2018). Again, private healthcare providers dominate the digital healthcare market with a staggering 90% of the market share in Sweden (Cederberg et al., 2018; 2019; 2020). It is also evident that the patronage of digital healthcare has increased in Sweden as a whole (Cederberg et al., 2020). Similarly, in the European Union, there is a concerted effort to increase access to safe and user-friendly healthcare through digital transformation, which is known as e-Health (European Commission, 2019). In order to enable digital transformation, digital interventions in the shape of services, processes, products, etc., must be planned and executed. The key to successful digital transformation is therefore implementation (Durlak, 2016).

2.3 Implementation of digital transformation in healthcare

Implementation is an area that has been given a substantial attention in research (Burnes, 2004; Cruess et al., 2008; Curtis & Brooks, 2020; Durlak & DuPre, 2008; Fennelly et al., 2020; Greenhalgh et al., 2004; Loomis et al., 2002; Ludwick et al., 2009; Milani et al., 2017). Implementation in digital transformation can be described as the ways and processes by which digital interventions are planned and executed to meet the needs of end-users (Durlak, 2016). In a study by Durlak and DuPre (2008), implementation is, generally, a multifaceted idea that requires the involvement of multiple stakeholders and consensus building to achieve a specific goal. To them, implementation is so important because when done properly, it ensures an acceptable outcome of an intervention and value for investment. The process of digital healthcare implementation includes tailoring of the intervention to ensure safe and good quality healthcare and putting contingency plans in place to deal with any unexpected eventuality that can occur during the implementation of
the intervention. It is very important to look at the kind of care the intervention would require supporting any existing infrastructure. There should also be friendlier caregiver and patient interaction interfaces, and the team that configures the system should include a variety of stakeholders to ensure that the digital intervention is safe and can support efficient and effective workflow (AHRQ, 2017).

In Appendix 1, the suggested steps for the implementation of a digital transformation by the AHRQ (2017) will be presented (See Appendix 1). The steps and timeline can be adapted to suit the particular intervention.

2.4 Success factors in digital transformation implementation

The search for factors that lead to the success of digital transformation implementations is an area that has been researched quite well (Curtis & Brooks, 2020; Fennelly et al., 2020; Imison et al., 2016; Milani et al., 2017). In a study by Curtis and Brooks (2020), it is discovered that three major success factors for digital transformation implementation are: (1) improved communication, (2) engagement of digital health technology with humanized care, and (3) protection of data security. In terms of communication, it is evident that improved access to technological equipment like tablets, smartphones, and computers will enhance both internal and external communication which eventually will contribute to the success of the intervention that is being implemented. In terms of engagement of digital healthcare technology with humanized care, it is clearly established that the emergence of technologies should not depersonalize healthcare. In other words, caregivers should interact physically with patients as well and not neglect them by entirely using technological equipment (Curtis & Brooks, 2020). The technologies should be user-friendly and should enhance human-to-human interactions. It is also established that, during the implementation of a digital intervention, much attention should be given to data security and confidentiality. Where proper care is not taken, the security of the information gathered from patients will be compromised, as such, the implementation of any digital intervention will be successful when proper security protocols are in place. These assertions are in line with a study by Imison et al. (2016).

In another study by Fennelly et al. (2020), the factors that account for a successful implementation of digital transformation include governance, leadership and culture, end-user involvement, training, support, and resourcing. To them, leadership and governance plays a critical role in the successful implementation of digital intervention. This is because all the major processes depend on effective leadership. This supports the assertion that everything rises and falls on leadership. End-user involvement for example makes it possible for the intervention to meet the needs of the users. It is also evident in a study by Milani et al. (2017) that focus on the end-user experience is essential for the success of digital interventions. This means that where feedback is frequently obtained from end-users on a regular basis, various interventions can be improved and thereby successful. Where there is a disconnect between the end-users of an intervention and the operators of the intervention, there will be problems. As discovered by Milani et al. (2017), for various digital intervention projects to succeed, it is very important for adequate training to be given to all key stakeholders who will be using the intervention. This will eventually ensure
or contribute to the success of the implementation. Similarly, the cultural or environmental context should also be taken into consideration as it has an impact on the success of the intervention (Milani et al., 2017). It is also discovered that competition makes it possible for developers of digital interventions to come out with services that are excellent and meet the demands of end-users (Siegel & Sikma, 2015).

2.5 Challenges in digital transformation implementation
Several research such as the works by Ajami and Bagheri-Tadi (2013), Castillo et al., (2010), Ford et al. (2006), Loomis et al., (2002), Ludwick et al. (2009), Meinert (2005), among others, has enumerated some of the challenges that can bedevil the implementation of digital transformation. Ajami and Bagheri-Tadi (2013), who conducted a study on barriers for adopting electronic health records interventions by caregivers using non-systematic review, identified that the barriers to digital transformation implementation include: (1) inadequate time by caregivers to properly become familiar with the digital intervention products, (2) absence of computer related skills, and (3) ineffective communication. First, it was observed that the doctors and nurses, etc., could not make enough extra-time to participate in training on digital interventions so that they can properly understand the various functions of the intervention properly. This is a major challenge to the successful implementation of digital intervention. Second, absence of computer related skills shows that although we are in a technological age, it is clearly established that many caregivers do not have adequate knowledge in the use of advanced computer skills such as typing the complaints and listening to the patient's complaint at the same time, knowledge of the dashboard of the digital intervention, among others. Essentially, not many people can do several things at the same time, and this actually leads to failures of digital interventions (Loomis et al., 2002). Third, ineffective communication between the implementers and end-users of the intervention. It was discovered that many users can not readily accept digital interventions because of ineffective communication (Ajami & Bagheri-Tadi., 2013). The fact that there is no proper exchange of information orally or by writing among others also leads to many interventions not seeing the light of day (Castillo et al., 2010). In a study by Ludwick et al. (2009), one of the major barriers to implementation of digital intervention is the issue of security and privacy. End-users tend not to trust the security and privacy of their information on the clouds or other storage devices and for that matter they cannot engage fully with the interventions. Similarly, Ludwick et al. (2009) observes that disruptions in the healthcare provider and patient relationship when looking for buttons and keys on the digital platforms demotivates some caregivers and for that matter avoid using the digital intervention though they know that it is a useful tool. Ford et al. (2006) also asserts that inadequate technical support to facilitate the use of the intervention also leads to failures in the implementation of digital transformation. It is evident in their study that most of the time, the technicians who could provide some assistance to most of the caregivers are not readily available when certain challenges occur with the intervention. These disruptions lead to failure in the implementation of digital transformation interventions. Also, Meinert (2005) indicates that, the complexity of the intervention in terms of the many navigation choices on the dashboard of the intervention make usability cumbersome for some caregivers and therefore they do not like to use the
interventions as a result of this. Meinert (2005) again states that the absence of adequate data exchanges among the numerous data systems at the healthcare facilities make digital transformation interventions a failure.

2.6 Implementation frameworks

There are many implementation frameworks which have been used in digital transformation within the healthcare industry, however, many of them lack certain constructs that can ensure a successful implementation of interventions (Burnes, 2004). To provide some examples, there are the Quality Enhancement Research Initiative (QUERI), which was used in 1998 by the Veteran Health Administration of the United States of America (Bammer, 2005), the Practical Robust Implementation and Sustainability Model (PRISM) (Kitson et al., 2008), among others. Although the purpose of implementation frameworks is to promote effective implementation, these frameworks have divergent terminologies and classifications which can be problematic during an implementation according to Damschroder et al. (2009). Also, they seem to miss one or more key constructs vital for an effective implementation. They have in other words been perceived as having some shortcomings and have therefore not been able to sufficiently address the issues of implementation. In order to comprise common dimensions of other implementation frameworks, the implementation framework called The Consolidated Framework for Implementation Research (CFIR) was therefore established with the aim of not replacing but embracing the relevant and significant constructs of other frameworks. Thus, the CFIR brings together the missing constructs in other frameworks (ibid).

In the beginning, the CFIR was a tool for a step-by-step evaluation of implementation theories. The idea was to evaluate as many implementation theories as possible until a saturation point or limit was arrived at. Today, however, the CFIR is used as a roadmap for the implementation of various digital transformation strategies in various business operations including healthcare (Kitson et al., 2008). Technically, it is a framework, which shows a “...professional consensus within a particular scientific community. It stands for the entire constellation of beliefs, values, and techniques shared by members of that community... [...] and] need not specify the direction of relationships or identify critical hypotheses” (Kitson et al., 2008).

The CFIR has five dimensions, and these are: characteristics of the intervention, outer setting, inner setting, individuals involved, and implementation process. The intervention feature is obtained from the perceptions of key stakeholders, i.e., people whose behavior needs to be changed, both internally and externally. The outer setting refers to the information emanating from governments, management, grassroot and trusted organizations. Individuals involved, refers to that the individuals to be engaged need to be familiar with the intervention through effective communication (Damschroder et al., 2009). According to Greenhalgh et al. (2004), there are four main processes within the implementation phase of the CFIR framework. These are: planning, engaging, executing, and evaluating, and these processes are not necessarily sequential. The planning has to do
with the degree to which the method and tasks for the intervention are developed. This process takes time and is supposed to be clear, detailed and adapted to a particular situation or context. Engaging has to do with the involvement of key stakeholders within the implementation. Executing involves the carrying out of pilot studies, simulations and the breaking down of the complex method into smaller manageable parts (Leeman et al., 2007). Evaluation has to do the process of assessing the progress of the method and taking corrective actions based on progress reports on regular bases. Evaluation falls within Deming’s plan-do-control-act (PDCA) framework. Also, the organizational culture and communication networks are essential in the successful implementation of an intervention. The skills set or expertise and implementation climate is also useful in ensuring the success of an intervention (OECD, 2002).

In the application of CFIR, there is the need to pay attention to adaptability, trialability, complexity, design quality and packaging, cost, etc. Impact evaluation provides information about the worth and impact of the program or intervention. Unlike process evaluations, impact evaluations are conducted at the end of an intervention to determine the extent to which anticipated outcomes were produced. They include impact assessments, cost-effectiveness investigations, quasi-experiments, randomized experiments and case studies. In sum, formative evaluation is done at the beginning and during the intervention, whilst the summative intervention is done at the end of the intervention (OECD, 2002). Below there is a graphical description of the CFIR framework (see Figure 1).

![An adapted version of the CFIR framework, including the five domains of the framework as well as their respective constructs (Damschroder et al., 2009).](image)

In the application of the CFIR framework, it is emphasized that adaptation of the framework may be needed to simplify the use as well as fit a particular situation or context (Damschroder et al., 2009; Leeman et al., 2007). According to Safaeinilli et al. (2020), tailoring the CFIR will also make it more accessible and relevant, especially in the context of healthcare. To therefore incorporate an adapted version of the framework will make the implementation, for instance, even more successful. Based on this, the study will continue
by diving into a description of the research methodology that to a large extent is based on an adapted version of the Consolidated Framework for Implementation Research.

3. Research methodology

In this section, the design of the study, including the research approach, philosophical approach, research method and data collection technique, will be presented, explained and motivated. The data analysis strategy will also be presented followed by the ethical principles followed by the study, as well as the methodological limitations.

3.1 Research approach

When discussing various research approaches, they often tend to fall into two distinctive categories: quantitative and qualitative (Keegan, 2009). According to Keegan (2009), quantitative research approaches, measures the proportion of a population that behaves or thinks in a certain way. Quantitative research often includes a large number of entities, addresses standardized questions, and focuses on drawing general conclusions of certain phenomena. Qualitative research approaches rather examine why people or entities behave or think in certain ways. Qualitative research includes much less entities, the standardization of questions can be of both low and high degree, and it aims to find a deeper understanding of a phenomenon. Qualitative research therefore helps researchers understand the contexts within which people live (Myers, 2013). For this research study, we aimed at shedding light on the complexities of digital transformation implementations, more specifically, to identify factors of success and challenge of digital healthcare implementations. In order to get a deeper understanding of the phenomenon, we therefore decided to employ a qualitative research approach.

3.2 Philosophical approach

As stated earlier, when categorizing research methods, it is quite common to make a distinction between quantitative and qualitative research (Keegan, 2009). However, according to Myers (2013), another way to distinguish research is from its philosophical approaches as all research is based on an underlying philosophical approach. There are three underlying philosophical approaches for qualitative research: positivism, criticism, and interpretivism (Myers, 2013; Orlikowski & Baroudi, 1991). The former, positivism, assumes that reality is objective and measurable, and independent of researchers. It claims that the objective world exists independently of humans (Dubé & Paré, 2003). Interpretivism is more subjective and claims that there is no such thing as an unbiased researcher (Walsham, 2006). The latter, criticism, is much less common than the other two. It slightly reminds of interpretivism, but the main difference is that critical research assumes that social reality is historically dependent which means that although people can change their social and economic circumstances, they are still constrained by culture, politics and socialness (Myers, 2013).

For this particular research, we decided that an interpretive philosophical approach would be most suitable since, as previously mentioned, interpretive research is subjective and claims that there is no such thing as an unbiased researcher. Interpretive researchers
try to get an understanding of phenomena through the meanings that people assign to them through language, meanings, instruments, etc. It focuses on the complexity of human sense-making as the situation emerges (Myers, 2013). This further means that interpretive researchers do not search for generalizations, rather generalizations that are more context bound, depending on the researchers, their research methods, as well as their interactions with the subjects of the research (Myers, 2013; Walsham, 1993).

3.3 Research method and case description
Authors and researchers often define research methods differently. But, according to Myers (2013), a research method is described as a way of finding empirical data about the world. Myers further brings up four different research methods: action research, case study research, ethnographic research, and grounded theory. For this particular study, a case study was conducted as the research method. Yin (2014) claims that case study research is the preferred method in cases when: (1) the research questions begin with “how” or “why”, (2) the researchers have limited or no control over behavioral events, and (3) the phenomenon that is being researched is contemporary. In this case, the research questions did not start with either “how” or “why”. However, the researchers did not have any control over the phenomenon or the events, and the researched phenomenon was contemporary and independent of the study, so therefore a case study was chosen as the research method. With case studies, the sampling is limited to a specific unit, e.g., an organization, often wrestling with a dilemma (Yale School of Management, n.d.).

This case study was conducted at a unit in a region in northern Sweden, to help them evaluate the implementation phase of a previously conducted digital healthcare transformation project, in order to streamline, sustain, and improve future implementation processes. Over the entire region, the organization is in charge of healthcare, dental care, public transport, research, education, among other things, and it approximately has 10,000 employees distributed over the entire region. The implementation phase that has been evaluated is of a previously conducted project of a digital healthcare intervention. The intervention is described as a service for patients and citizens of the region to have digital healthcare meetings regarding all sorts of conditions, diseases, etc., with caregivers over a video conference call. The service of the digital healthcare meetings reminds of a communication platform such as Microsoft Teams or Zoom but differs in the way that it is encrypted in order to protect the secrecy of the patients and citizens. To use the service, it is required for the patients and citizens to have access to a smartphone, tablet or computer with microphone and camera, as well as an electronic ID, such as BankID. There was a project team in charge of the implementation process, and after the actual implementation it was handed over to the post-management for them to provide the service, and simultaneously be of support to the caregivers and patients and citizens using the service.

3.4 Data collection technique
Two of the most common qualitative data collection techniques are observations and interviews. This research study employed interviews as the main data collection technique. Interviews are most common in most qualitative research methods, as it allows researchers
to gather rich data from people involved in the researched phenomenon. Further, interviews often differ between three types: structured, semi-structured, and unstructured. Structured interviews include some pre-formulated questions often asked in a specific order, in order to ensure consistency and generalization across a number of interviews. Unstructured interviews often do not include any pre-formulated questions at all, with the purpose of having the respondents speak freely (Myers, 2013). We chose to conduct semi-structured interviews which are a mix of the two. The reason for this choice is that they include some pre-formulated questions for the researchers to originate from in an approximate order, but at the same time offer some freedom for the respondents when designing their responses to the questions. Such interviews therefore provide an opportunity for the interviews to move in different directions and the answers to be relatively open, nuanced and reflective, but at the same time guarantee that important aspects from the researchers’ point of view gets outspoken (Bryman, 2018).

The initial interview questions for the semi-structured interviews were based on the study’s theoretical framework as well as an interview guide provided by the CFIR Research Team Center for Clinical Management Research (2021) which provides questions based on the CFIR domains and constructs. Based on the recommendations by Damschroder et al. (2009), Leeman et al. (2007), Safaeinilli et al. (2020), among others, the CFIR has thereby been adapted to fit this specific evaluation, for instance by adapting and removing some of the questions below each domain, as well as by adding further questions relevant for the study. Further, the questions that have been asked have varied slightly between the respondents, depending on their role and point of view of the phenomenon. In order to be able to test and refine the interview, as well as practice prior to the rest of the interviews, the first conducted interview was labeled as a pilot interview. Following the pilot interview, minor changes were made since some questions were found to be of less relevance. Some questions or parts of questions were therefore removed or altered; however, the overall data could still be used the same way as the rest of the interviews. There were six interviews conducted in total, whereas the minutes of the interviews varied from 18 to 69 minutes. The average time for the interviews was 48 minutes. All interviews were recorded in order to later be able to transcribe them prior to the data analysis. Five interviews were conducted over the business communication platform Microsoft Teams, and one over the telephone.

Additional data is minutes of meetings from the meetings with the representatives at the organization the case study was conducted at. There were eight meetings conducted in total. The minutes of the meetings varied from 20 to 45 minutes and the average time for the meetings was 29 minutes.

3.5 Sampling strategy
The sampling strategy chosen for this study was a purposive sampling. Purposive sampling is also known as judgmental, selective or subjective sampling as it bases on the judgement of the researchers when selecting respondents or research subjects (Lund Research, 2021). The goal of purposive sampling is not to make generalizations of an entire population, but to focus on particular characteristics of a population that is of interest and therefore select specific research subjects that, given the topic of study, will give the most relevant data. The
aim of this sampling was therefore to include individuals with valuable insights in various aspects in the implementation process (ibid). At the recommendation of the representatives at the region the case study was conducted at, we decided to contact a number of possible respondents through e-mail. In order to expand the diversity of the study and get a representative picture of the phenomenon as a whole, those included respondents with different tasks and backgrounds such as a project leader, project participants active in the project, a nurse as well as an end-user, which in this case was a patient. Based on primarily their roles and experiences of the implementation, all respondents were carefully selected. In order to link the respondents to the statements that are linked to them, a table of a summary of the respondents has been created which can be read below (see Table 2). In order to protect their privacy, the respondents’ names have been changed to pseudonyms, and their age has been changed to age intervals.

Table 2  
Summary of the respondents in the study, including pseudonyms instead of real names, roles, gender and age intervals.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Role</th>
<th>Gender</th>
<th>Age intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oscar</td>
<td>Project leader</td>
<td>Male</td>
<td>50-60</td>
</tr>
<tr>
<td>Emma</td>
<td>Project participant</td>
<td>Female</td>
<td>40-50</td>
</tr>
<tr>
<td>Maria</td>
<td>Project participant</td>
<td>Female</td>
<td>50-60</td>
</tr>
<tr>
<td>Sara</td>
<td>Digital strategist</td>
<td>Female</td>
<td>30-40</td>
</tr>
<tr>
<td>Victoria</td>
<td>Nurse</td>
<td>Female</td>
<td>40-50</td>
</tr>
<tr>
<td>Jacob</td>
<td>Patient</td>
<td>Male</td>
<td>60-70</td>
</tr>
</tbody>
</table>

3.4 Data analysis approach

Following the data gathering phase is the data analysis phase. As there is a large volume of data to collect, organize and manage, data analysis is a crucial stage in qualitative research. It is therefore, according to Hackett and Strickland (2018), important to choose the analytical approach very carefully. There are a large variety of data analysis approaches, such as thematic analysis, narrative analysis, discourse analysis, hermeneutics, and so on. There are also a number of ways and tools available to simplify the data analysis, for instance through various software programs and tools (Myers, 2013). For this study, the conducted data analysis approach was framework analysis which offers a systematic structure especially useful with large volumes of text (Ritchie & Spencer, 1994). The framework analysis was based on domains of the CFIR framework and was therefore deductive, that is “theory-driven” and confirmatory (Myers, 2013, p. 23). The primary guidelines of framework analysis presented by Ritchie and Spencer (1994) and followed by this study are: (1) familiarization, (2) identifying a thematic framework, (3) indexing, (4) charting, and (5) mapping and interpretation. In order to familiarize ourselves with the data, we started by trying to gain an overview of the gathered data and immersing ourselves in the data by listening to the recorded audio from the interviews, taking notes of the audio, as well as transcribing and then reading and re-reading the transcripts. Next, in order to
identify a thematic framework, we tried to identify key issues, concepts and themes from the notes that reflected the domains of the CFIR as well as the experiences of the respondents. The transcripts were then re-read and indexed to sections by selecting the most relevant fragments based on the thematic framework. Next, the indexed sections were charted and summarized, by trying to write and tell the stories of the indexed sections, to later be developed into main themes and sub-themes by going through all transcripts again. The entire process was conducted via text, meaning that no other tools were used. Appendix 2 provides an extract from the analysis phase to provide an example of how the analysis looked like (See Appendix 2).

### 3.7 Ethical considerations

Throughout the entire study, the study has followed the ethical recommendations provided by Vetenskapsrådet (2017) that addresses legislation and ethical requirements and recommendations in research ethics. According to Vetenskapsrådet (2017), researchers are expected to strive for high quality research. This means that researchers have a responsibility to mainly the people participating in the research, but also towards all those that may be positively or negatively affected by the results of the research. Therefore, researchers must not be influenced or manipulated externally nor should act in the interest of themselves or other stakeholders. Further significant parts of ethics in research are that individual privacy must be protected, as well as harm or risk of harm for the respondents. Research ethics is therefore primarily about how people participating in various research can and should be treated, and that they should be protected from harm and wrongs. This criterion is called the criterion of protection of the individual. However, just as the protection of individuals is vital, so is the conduction of research. Research is namely necessary for the development and improvement of both people and the society in general, especially in areas such as health and environment. This is called the research criterion. Research ethics is therefore also about achieving a balance between the two criterions - thus, to conduct good research with an important purpose, and simultaneously protect those taking part in the research.

For this particular study, all ethical recommendations by Vetenskapsrådet (2017) have been applied and followed. This inter alia means that the individuals involved in the research as well as their privacy have been protected and that they have not been exposed to any risk, all individuals as well as their responses have been fully anonymized, and that there is an informed consent from the respondents to both be included in the study, for the interviews to be recorded, and lastly for the thesis to be published. This also means that the respondents at any time could suspend their participation in the study if they for any reason would like. There is also an outspoken permission to publish from the organization which the case study has been conducted at. Further, the respondents have also been notified of their task in the thesis as well as the purpose of the thesis. Respondents’ names and personal data have been and will continue to be treated anonymously, for instance by changing their names to pseudonyms and their ages to age group. The name of the organization and project have also been fully anonymized in order to protect the safety of the respondents.
3.4 Methodological limitations

As interviews are not always successful the very first time, we decided to conduct and label the first interview as a pilot interview, in order to be able to refine the interview guide. Due to that, we were able to shorten the interview guide in order to have enough time to ask the most relevant questions to the rest of the respondents. Therefore, we decided to remove questions that would not be that relevant and not help us answer the research questions.

Furthermore, all interviews were based on the CFIR framework in order to inline the interview questions with the research purpose. However, to base the questions on only one framework could have prevented us from seeing things outside the framework. In order to decrease that risk, we decided to adapt the questions to fit this specific study. The analysis was also based on the same framework. Naturally, however, the same risk applies there. To use the very same framework for both the interview and analysis stage could have led us to see what the framework wanted us to see, and therefore other important parts may have been missed. The risk of missing important aspects of the implementation process that has been researched, has thereby increased and it could eventually be tough to even know if something has been missing. Notwithstanding, as the research questions and objectives of the study are in line with the framework, we believe that basing the research on the CFIR has been beneficial for the study. We consider the CFIR to be comprehensive and of good standard, and as the interview guide has been adapted to suit the purpose, we do not believe that any valuable questions or aspects have been left out.

The respondents that have been included in the study largely represent different groups of people with different views on and experiences of the process. We believe that one of the strengths of the study is that it included the perspectives of different groups and individuals, as the diverse nature of the views from different people has increased its depth and inclusiveness. All respondents were simultaneously chosen for their adequate knowledge about the process, which further validates the study’s outcome. As the respondents all had such different roles, the interview guides were also personally altered after each respondent’s role. That meant that they were all asked slightly different questions. However, it is also useful to state that the study only included one nurse and one patient. We, of course, understand that they cannot be perceived as representatives for all nurses and all patients. The reason for including those particular respondents was simply because the nurse had adequate knowledge of the implementation process. The same applied for the patient, which had greater understanding of the process and the digital intervention itself than many other patients. The implication of that is that there could be a high possibility for data saturation if we were to continue by including more nurses and patients or citizens in the study. The generalization of the study would also be higher.

The sampling strategy was labeled as purposive sampling, and as stated earlier, the respondents were chosen based on the recommendation of the representatives at the organization the case study was conducted at, i.e., the region in the north of Sweden. There are always risks with purposive sampling, but in this case, that was the best possible option. Without the help of the representatives, the process of collecting respondents would have been much more tough and lengthy, and the study probably would not gather respondents with such important insights on the situation either. Furthermore, the study was also based
on one single case, meaning that the results cannot be generalized for all implementation processes. The study also relied on a summative evaluation, as the project that was investigated had already been implemented. This means that questions for the respondents relied on their memory of things that happened in the past. It would therefore have been valuable to include a formative evaluation in the study as well.

Throughout the study, something that has been of great importance is the ethical considerations of the study. Finally, it is also important to mention that all methodological decisions have been carefully selected and are considered to be most suitable for this particular study.

4. Analysis and result

In the following section, the analysis and result of the gathered data material will be presented based on the structure of the five domains of the Consolidated Framework for Implementation Research (CFIR), which are: characteristics of the intervention, inner setting, outer setting, individuals involved, and implementation process.

4.1 Characteristics of the intervention

The service the digital healthcare intervention offers was described as an alternative for physical patient meetings. The respondents saw the intervention as partly a solution for patients with long distances to hospitals and healthcare centers to see a doctor or nurse. The digital strategist Sara testified:

“Concerning the patients also, we have long distance patients in this region, so it’s extremely far and difficult for some patients to travel from their homes to the healthcare center. [...] And so, if it’s possible for a patient to meet a doctor or a caregiver in the comfort of their homes or their offices, they find that to be more convenient.” – Sara

When it came to the origin of the intervention, it was mentioned that long distances also were the reason for why it was decided to be implemented in the first place. The project participant Maria explained this further:

“When you develop things, it always starts with a problem. [...] And the primary care division had a problem. They don’t have enough doctors in our region, and especially in the countryside. [...] And some people [...] realized that ‘what if we could have primary care doctors who can work remotely?’, so that they can extend their service to other parts of the region.” – Maria

As the service offers an alternative for physical meetings, the project naturally also got highly prioritized with the rise of the Covid-19 virus pandemic, as that caused much to be conducted remotely instead. Naturally, the project was described as very intense due to that as well. The project participant Emma stated:

“In the beginning, I was supposed to be a support, both for my colleague that had a lot on her plate, but also for the care units. But then the pandemic happened, and overnight everything expanded, and I went from working a couple of hours a week with the project to 120 to 140 percent.” – Emma
In order to still be able to be available for all those not able or willing to go to the hospital themselves during the pandemic, the project was described as prioritized from all directions, for instance from management, IT as well as the care units. Everything else therefore needed to be set aside, according to the respondents. The project was also experienced to get a lot of support from all sorts of directions. The project participant Emma also mentioned that there were a lot of people willing to help and support her and the rest of the project team. She said: “you notice that when something is as requested as this was... then it might be doomed to succeed”.

Moreover, the implementation process was described to have been planned for a few years prior to the actual start. However, the project participant Maria stated that they turned out to not go according to the initial plan, due to the circumstances of the Covid-19 virus pandemic. Even so, the project was described as a huge success. She said: “in economic terms it was a huge success. Because we implemented the project on over 40 units at the same cost of doing it on 12 units”. Naturally, the pandemic had a big impact on the implementation process. But in this case, it was described as a positive factor. The project leader Oscar also testified to that:

“When the pandemic happened, it sorts of accelerated things, because everything became possible. Decisions that probably took like several months before, you could have them now in a couple of days. [...] So, working with this kind of project in those times and circumstances made us learn [...] that anything is actually possible. A lot more than you think.” – Oscar

This was something that the project participant Emma also agreed on:

“It’s never fun with a pandemic, but if you talk about these windows of opportunities that open up, due to the crisis that the pandemic means. [...] This was one of those things. I don’t believe that we would have been where we are with [the project] if it weren’t for the pandemic.” – Emma

4.2 Inner setting

It was stated that there has been a lack in resources when it comes to the administration of the intervention. The digital strategist Sara mentioned that: “...I think we need to have more human resources. Right now, I am the only one who basically works with this in the whole region. [...] I think that we need to have more people so that we can give better support to the caregivers”. Nevertheless, she also stated that they were planning to increase the resources, which in her opinion would have great influence.

The general level of receptivity in the organization to implementing the intervention was somewhat divided. The project participant Emma stated that one challenge of the implementation process was to get people onboard with the implementation. She stated that many people involved in the implementation process, primarily healthcare personnel, often tended to see and focus too much on the challenges and obstacles with both the implementation and intervention itself. One particular example brought up by the respondent was that many people very quickly said “but what about those that don’t have BankID? [...] Everyone doesn’t have a BankID and then we won’t be available for everyone”. Instead of focusing on those aspects, she meant that the primary focus should
be on getting started with the implementation and the service as it was at that moment. That way they might have time and resources to increase the availability to those without electronic ID later. As the use of the service was and is voluntary among the healthcare units and centers, the respondent also stated that it would have been preferable to instead have made the decision that all units at the hospital and all healthcare centers eventually should and must use the service. Emma stated that: “...there were pretty much that was optional and that is the risk when originating from the units formulating their needs themselves. Instead of giving them a decision they have to follow. [...] It then gets tougher for them to actually get started”. Another respondent also testified to this, and that was the project leader Oscar: “...there wasn’t then a clear path or decision on how to go about, and that I think, could have been better”.

The patient, Jacob, stated that once the possibility of conducting the patient meetings, which in this case was follow-up meetings of a previous treatment, online instead of physical meetings was discussed, some of the doctors grunted as they claimed that they much rather wanted to see the patient live instead. The nurse, Victoria, confirmed this and said that in her experience, doctors occasionally tend to be a bit more hesitant to digital meetings. Nevertheless, Victoria further stated that the general level of receptivity among her and her colleagues mainly was positive as the service was described as less time consuming, mainly since it is more “to the point” and includes much less small talk as with a physical meeting. This in turn saved her and her colleagues time for other tasks, such as administrative tasks. Even colleagues that often have trouble using technology were positive towards the use of the service. It was also described as a very safe alternative to physical meetings, as everything is classified through electronic ID.

Something that as previously mentioned was described as really important for the implementation process was support. The support from management, stakeholders and other directions was labeled as a huge success factor for the particular project. The project participant Emma mentioned that besides management and the project team itself, there were a lot of other people willing to help and support the project, for instance the colleagues of the project participant, but also people at other departments as well. It was also mentioned that the support of the project leader in the project played a big part. Furthermore, the support from the project team to the care units involved in the pilot project was also described to have great value. Both project participants, Maria and Emma, stated that they made themselves very available to the units if they would have questions or other thoughts. Maria stated that: “this is important because with implementation of services like this, the project participants need to be available to help users understand and be able to use the service effectively”. The nurse Victoria described that her unit had a contact person from the project team that was very quick to get to them in case of technical issues, among other things. The same contact also introduced her and her colleagues to the service and held some seemingly unstructured training through various meetings. During the training, the caregivers got to test the service and practice by either conducting a meeting with one of the project participants or a colleague pretending to be a patient. They did cases of different kinds in order to get a glimpse of the patients’ point of view.
According to the project participant Emma, the next step of the training should have been to test the service on actual patients to hear an actual description of their experience of the service. However, this was not part of the process which Emma stated that she regretted afterwards. She stated that it would have been valuable to include the patients and citizens in the process as they are such a big part of the service. She said that “I mean, without them [patients and citizens], we don’t need a project. Then we shouldn’t work with these kinds of things. If we don’t have patients or citizens, then we are not needed either”. In general, Emma did not think that this has been reflected on that much in the past. To some extent maybe, but not enough. Therefore, she claimed that during future implementation processes within the organization, the citizens and patients should be more involved. This was also something she said that she would take with her to future projects - to create these kinds of prerequisites from the early beginning by creating the network needed to succeed with a project, instead of waiting towards the end and then realize that “oops, we should talk to ‘this’ person” or something like that. That was not only related to patients and citizens, but also other people or groups from other departments with relevant skill sets for the projects.

4.3 Outer setting

Overall, the experience of the service among all respondents was very positive. Aspects such as reduced wait and less time-consuming meetings, increased availability and convenience, and reduced travel which in turn leads to less impact on the environment were examples brought up by the respondents. For patients, the service was described as a good alternative to physical meetings and according to the nurse Victoria, the service was almost always the first choice among her patients. The patient Jacob said: “from my point of view, it is only positive! I don’t see any disadvantages with it”. He further said that he almost demanded to have the meetings online instead of at the hospital as he had 600 kilometers to drive back and forth to the hospital whilst simultaneously being exhausted from a previous treatment. The digital strategist, Sara, also commented on his case:

“[He] needed to travel for approximately 600 kilometers in and out for each check-up. So instead of that, he can just meet his caregiver through digital meetings. And he is very happy and relieved with this digital service. Because he does not have so much energy to begin with, coupled with the stress that comes from travelling just for a check-up and the saved time he gladly spends with his family.” – Sara

Throughout the process, the region has also elicited feedback and ratings of the patients and citizens that have come in contact with the service. For instance, Oscar the project leader mentioned that each person taking part in a meeting afterwards had the opportunity to give quick evaluations of the service. In addition, they have also kept a close eye on the ratings of the application on App Store and Google Play where the application is downloaded. To keep track of the service itself in those kinds of ways was described as very important during the implementation process.

Most respondents said that they believed that the needs of patients and citizens of the region were the primary concern when deciding to implement the service. The nurse
Victoria stated that she experienced the presentation of the service in the beginning as an alternative for citizens in smaller cities with longer distances to the hospital in the region. Therefore, the focus in the beginning were those kinds of people. She also said that: “I simply believe that that is what they have originated from. The needs of the patients first and foremost”.

One of the respondents differed in this question, and that was Emma, the project participant. Her belief was that the main focus during the project was rather on the needs of the care units, such as clinics at the hospitals and healthcare centers. She said that: “I believe that there was a big focus on the care units’ needs. [...] And I would have gladly seen that there maybe would have been more conversations with the patients”. She further explained that it would be valuable to include and talk more to citizens and patients in order to hear their thoughts regarding their own needs in order to be able to cater for them. The respondent also stated that that was something her and her team could have done differently throughout the implementation process, and that there should have been a greater focus on the citizens and patients. She stated that: "I believe that you can never get too much input from patients and citizens when developing and implementing new work processes. You can never get too much. On the other hand, it is always too little”.

When it came to competitiveness, the project participant Emma said that: “...something I find so interesting is that when comparing this to, for instance, the Kry application or Min Doktor, where they just... showed up and worked. But it is so much more complicated to achieve within a region”. That was something she thought the organization should up their game at. She also said that: “I am completely confident that those turning to Kry and Min Doktor, much rather would log in to the region’s app, but want the service that Kry and Min Doktor offers”, meaning that a majority would choose the region’s app, if it would provide the same type of service as the previously mentioned applications. Furthermore, Emma also stated that the region should take the opportunity to outcompete such actors, especially since the technology already is up and running, and the competencies among doctors, nurses, and so on, already is there. Another respondent, Sara, also mentioned that the competition from private healthcare providers such as Kry or Min Doktor has increased the need for a similar service from the region and to the patients and citizens. Therefore, according to the respondent, the competition from private healthcare providers played a key role in the decision to implement the service, since it led to a more accelerated process.

4.4 Individuals involved

It was stated that in the beginning of the implementation process, many caregivers did not trust the intervention, but later appreciated the effort and the need it was about to address. Maria, the project participant, said: “some staff members were not comfortable about switching and using this service, but they did it because they had to, and because they love their patients. And they realize that if they don’t adapt to this digital service, they cannot meet their patients”. Connected to that, Maria also added:

“...people were a little bit afraid of many things like, some healthcare workers wanted to sit next to their patients and be in the same physical space. Some were also afraid due to their past experiences with digital meetings in the past."
A few years ago, when the technology was not ready, the experience wasn’t great, the meetings were bad with horrible sound quality, but now technology has improved compared to years ago, so it worked much better.” – Maria

The same was stated by the project leader Oscar:

“This project started with very low participation, mainly because the [caregivers] were unsure if this was the solution that was going to be handed to them or delivered. So, in that aspect, they didn’t trust to use it fully.” – Oscar

Nowadays, as previously mentioned, the individuals involved in the use of the digital healthcare service, such as nurses, were described to be very positive towards it as well as confident to use it. After the training in the beginning, the nurse Victoria also stated that in turn, she and the rest of her colleagues that were part of the pilot project have helped their other colleagues by introducing the service. She further said that it was not at all hard to learn. Victoria also stated that there have been a lot of forums and meetings where those involved in the implementation have sat down and shared experiences and tips. The respondent also stated that both her and her colleagues have had a say during the process, and that the project team has been very keen to hear their opinions. She provided one example which strengthened this:

“Just to provide an example, in the beginning, if you had booked a meeting which was 30 minutes long, and you haven’t been able to get in contact with the patient the first fifteen or ten minutes, then the meeting automatically got cancelled and you had to wait until the 30 minutes was up in order to reschedule. [...] Then we shared our opinions which they really listened to and kind of changed the system so it will be smoother. They have been susceptible to both critique and opinions and so on.” – Victoria

The digital strategist, Sara, also testified to that:

“[The caregivers] have been very much involved in the project group. [...] The caregivers needed to be the one who felt ownership of the implementation, they had to want to do this, nobody has been forced to say that now we’re implementing this, you must do it, this has not been the case. The case has been all along that the caregivers wanted this. So, they have been very much involved and they have also been all the time giving their input. [...] So, without the input and energy and the will from the caregivers, this would have been completely impossible.” – Sara

Connected to that, the project participant Maria mentioned that one of the things she would take with her to future projects, is the availability of the project team. She claimed that it is important to not only focus on influential stakeholders, but also other users of the service. She stated that:

“I think they [the project participants] should be available for everyone, explaining the different stages of the implementation and helping users to understand and use the service. Organize user meetings and do not focus on only the leaders, though they are important stakeholders in the process. I believe this is especially important.” – Maria
4.5 Implementation process

When asked if the project team used implementation frameworks during the implementation process, they stated that they did not use a specific framework to ease the process. Instead, they said that they created their own structure for the project, that in their opinion worked well during the circumstances. However, when it came to structure, the project participant Maria also added that: “most of the points that I recommend for the next project is that [the region] as an organization should have another structure [...] when it comes to decisions and communication”. The project leader Oscar added to that:

“You’ve been a number of individuals working with it and then you say [...] ‘it’s implemented!’ Then another part of the organization is taking it further. [...] And maybe there’s not a clear decision on what it would lead to. So, that is something I would say that is very important.” – Oscar

When asked if the digital healthcare service had been implemented according to the implementation plan, the opinions differed slightly. The respondents involved in the implementation process stated that the planned strategy was followed, but it was also mentioned that the effects of the Covid-19 pandemic changed the situation entirely.

It was also asked whether the right people were involved in the project. The project members were unanimous that it was. Emma, the project participant, for instance described that one important factor was that they all brought different perspectives to the table based on each of their backgrounds. For instance, one of the project participants had worked with digitalization as well as this project in particular for many years, and the other one had many years’ experience as a nurse. One respondent, Sara, the digital strategist, who has been working with the post-management stage of the project, disagreed slightly on the question and said that something that could have been done differently during the implementation process is to include someone that after the actual implementation would be in charge of managing the project. She stated that it would be beneficial to include at least one person from the post-management of the project from the early beginning, as that would result in necessary knowledge and great understanding of all phases of the project. This in turn, would lead to a much more effective post-management stage of the project. Sara stated:

“...this knowledge that they will acquire will be an experience which cannot be translated on a paper or manual, and [they] can transfer this knowledge and experience to the post-management of the project and train other people that join the project.” – Sara

The project leader Oscar also testified that: “so, that is something I would say that it’s very important. That the one person or persons that will take it further when the project closes, they should be part of the process during the implementation stages”. Nevertheless, Sara the digital strategist also stated that one particular success factor for the project was that it had such a close working relationship with the caregivers and healthcare providers. She stated that: “…they have a nice combination of people working. [...] I think that the combination of these people was very efficient”.

One challenge that was brought up under this domain was to obtain the necessary equipment needed for the digital healthcare service. The project participant Maria stated that most of the care units did not have a lot of hardware, in terms of laptops or computers, and so on. Due to the pandemic, and the increased telecommuting that came with it, it was even tougher to get hold of the hardware needed. Oscar, the project leader, also stated that:

“It was also difficult in this situation, to get the equipment needed. We couldn't get a webcam, or some headphones, or headsets, and so on, because the whole world started working [...] remotely and sort of off premises at the same time. So that was quite a big challenge for us, actually. They were ready to start working more and more with this, but we couldn't get the equipment.” – Oscar

The Covid-19 virus pandemic was therefore not only described as an advantage for the particular project. Rather on the contrary in this case. The project participant Emma added: “We tried ordering hardware - cameras and headsets. It was very, very difficult. [...] It was a big challenge to find laptops and stuff like that. There was an extreme shortage of those kinds of stuff”. This was also related to the steering committee. It was stated by one of the respondents that the steering committee was very supportive and had people in the right positions, which was especially important in this case as all the decisions that were made needed to be consulted with the steering committee. The project group did not have the power to make decisions of their own. However, in this case, the challenge of getting the necessary equipment, the help and support could have been better. The project leader Oscar stated that: “I think [the steering committee] tried to support and gave us the support they could. So, in some respects, very good. In other respects, not that good”.

5. Discussion

In this section, the insights from the analysis and result presented in the fourth section will be discussed, reflected on and compared to the related research and theoretical framework presented in the second section. The discussion will begin by discussing success factors, followed by challenges.

5.1 Success factors

The study began with the aim of identifying the success factors in the implementation of a previously conducted project of a digital intervention in a region in northern Sweden. Firstly, it was evident that some of the factors that made the intervention successful included competition from other caregivers, especially private healthcare providers. It was mentioned that it had value to the implementation process in the sense that it upped the need for a similar service as the ones provided by other caregivers, competitors that is. It was therefore deduced that competition could be a key to achieve success in the implementation and use of any digital intervention. This is connected to findings in the related research as well, as competition is stated to make it possible for developers of digital interventions to come out with services that are as good as possible and of course, also meets the needs of end-users (Siegel & Sikma, 2015). Competition thus makes implementers work harder to create substantial value to end-users, which in this case was
patients and citizens of the region in the north of Sweden. According to Curtis and Brooks (2020), competition also makes it possible for developers and implementers of an intervention to always think of ways of overcoming the obstacles they may face in the course of the implementation of the intervention.

In addition, another success factor was surprisingly the outbreak of the Covid-19 virus pandemic. Without any doubt, it was clear that the protocols and restrictions of the pandemic in turn made it clear that “the new normal” is the digital way. Observance of protocols such as avoidance of overcrowded areas increased the patronage of similar digital interventions astronomically (Hollander & Carr, 2020; Fisk et al., 2020). The digital healthcare intervention, which was described as a digital alternative for physical patient meetings, increased the opportunity for doctors and nurses to meet patients and citizens of the region online instead of face-to-face. So, it was described as absolutely vital to conclude and succeed with the implementation of the intervention, since caregivers otherwise would not be able to still be available to patients and citizens not able or willing to physically visit hospitals or healthcare centers. This in turn led to increased support and help from various directions. Also, the pandemic was described to have accelerated things. It was, for instance, mentioned that decisions that normally would take several months, instead only took a couple of days in this case. Moreover, it was clear that the implementation process that was observed turned out to be completely different from what was initially planned, due to the pandemic. More than ever, this speaks for the need of a more structured process in order to ease the circumstances that came of the pandemic. This can be enabled with the use of a structured framework such as the Consolidated Framework for Implementation Research (CFIR). According to Damschroder et al. (2009), the use of the five domains of the CFIR namely provides a pragmatic structure that can be used in multiple settings and contexts. It is also easily customized to diverse situations and scenarios (CFIR Research Team Center for Clinical Management Research, 2021), meaning it would be especially appropriate in a situation such as the virus pandemic.

Another main success factor in the particular project was the high involvement of caregivers and care units in the implementation process. It was stated that without the inputs, energy, or will from the involved caregivers, the process would be completely impossible to succeed with. On the other hand, the efforts from the project team were also described to have high value. The project participants were stated to be easily accessible for caregivers and care units in case of questions or other thoughts. Connected to the related research, Ford et al. (2006) stated that one major challenge in implementation processes is when technicians and implementers are not available to the caregivers when for instance challenges occur. This was not at all proven to be the case in this case, since it was heavily claimed by the respondents that especially the two project participants in the project team were close at hand, not only when eventual issues would arise, but in general too. Connected to this, was that the right people also were described to be involved in the process. It was mentioned that one success factor in that aspect, was that luckily, the project team had good chemistry and got along well. But mainly it was stated that the different backgrounds and competencies of the respective project members was key.
5.2 Challenges

The study also aimed at identifying the challenges faced by the region in the north of Sweden in the implementation of the digital healthcare project. In related research, it was found that ineffective communication between implementers and end-users was a barrier for successful digital transformation implementation. In fact, this was also stated to be a big reason for why many interventions eventually do not even see the light of day (Castillo et al., 2010). In the case of the implementation process by the region, the involvement of end-users, i.e., patients and citizens, was described as very low. It was even stated to be one big regret of the implementation process, since the involvement of patients and citizens would have provided valuable opinions and inputs. This would have been especially important in order to improve the patient care outcomes of the digital healthcare intervention that was being implemented.

Another identified challenge had to do with the inability of some clinics to embrace the service and/or take ownership of the intervention. This was proven to initially be based on the low level of trust in digital intervention. This is related to findings by Ajami and Bagheri-Tadi (2013), which claims that a major barrier for a successful implementation of a digital intervention is inadequate time by caregivers to properly familiarize themself with the intervention in question. This can be challenging since they then might not properly understand important functions of the intervention, which in turn can lead to the intervention not being used effectively. Similarly, Curtis and Brooks (2020) also mentioned that engagement from caregivers was a huge steppingstone in the adoption of a new digital intervention. Nevertheless, in this case, it was stated that as the implementation process continued, the level of trust also increased.

Furthermore, it was also stated that, although the implementation process to a high degree was described as involvement of “just the right people”, it should also have involved someone from the post-management stage of the project. It was stated that involving such a person in all phases of the implementation process would result in knowledge and understanding that could not later be translated on paper. Connected to that, it was also stated that both the administrative and human resources of the service were lacking in the post-management stage in order to effectively run the intervention the best way possible.

As mentioned earlier, the effects of the Covid-19 virus pandemic were stated as a huge success factor in this case. However, the pandemic also aggravated the process of accessing necessary equipment for the usage of the implemented intervention, such as high-quality cameras, computers, etc. Therefore, it was in this case also labeled as a challenge. In relation to this, according to Curtis and Brooks (2020), one of the major success factors for digital transformation implementations is improved communication. It is evident that increased access to technological equipment will enhance both internal and external communication. Thus, lack of equipment is not only disadvantageous for the intervention to work accordingly, but also for streamlining the communication during the implementation. Lack of communication will in turn therefore naturally lead to a less successful implementation. Another factor which was described as a success, was competition. Nevertheless, it was also found to be a challenge. As a challenge, it takes away the ability of organizations to set their own way and method and stick to it for a long time.
because the competition will force all competitors to change and adapt rapidly to the competitive forces. Again, there is likely to be the dominance of the clients and an increasing digital transformation market complexity. There would be new sources of competition as new digital interventions are developed and changed.

Another challenge that was encountered was the decision-making approach of the process. It was observed that the top-down approach mainly was used for decision-making. This is challenging, as it can lead to subordinates not being as incorporated in decisions. In other words, centralization of decision-making can be a challenge to contribute to effective and successful implementation processes. Thus, it would be valuable for decision-making to be decentralized. Fennelly et al. (2020), also states that leadership and governance play a key role in the successful implementation of a digital intervention, since all major processes depend on effective leadership. In confirmation of this assertion, Haggerty (2017), Machado et al. (2019), as well as Tuzii (2017), all indicates in their studies that despite the numerous technologies in the business environment, a lot of implementations fail, since some of these processes ignore the individuals within the context.

Connected to decisions, it was also stated that there was a lack of structure in primarily decisions and communication. This clarifies the importance of using an implementation framework during the implementation process since it provides a pragmatic structure for implementations. Naturally, this speaks in favor of using the CFIR since it can be used as a roadmap for the implementation of digital transformation intervention (Kitson et al., 2008). In this case, a specific framework was not used to ease the process. It was also deduced that many of the key individuals did not understand the use of structured frameworks like the CFIR. It was also evident that some clinics were not adequately prepared to use the digital healthcare intervention, and this accounted for their inability to use it effectively. This means that each clinic has its unique inner and outer settings, which should be aligned to the CFIR. Therefore, we hope that the framework should include organizational process assets under the domain of “characteristics of the intervention”.

In addition, each clinic should be given adequate training in order to effectively run the intervention. According to Milani et al. (2017), for implementations to succeed, it is highly important to provide adequate training. It was discovered in the data analysis that there was some training, but that training was not properly structured. It is however realized that there is an urgent need to carry out a more structured training. In other words, there should be a clearly specified goal and timeframe, log of activities, designation of roles and responsibilities as these will insure staff development more than unstructured training.

6. Conclusions

This study aimed at finding factors of success and challenge related to implementation processes, by examining and evaluating a previously conducted healthcare implementation process in the digital transformation field in a region in the north of Sweden. Related research in the field of digital transformation implementation shows that despite phenomenal innovations and huge investments in digital technologies, most digital transformation interventions fail, and the healthcare context is not an exception
(Damschroder et al., 2009). Reasons behind the failure for instance include inadequate time to familiarize with the intervention that is being implemented, lack of required technical skills, as well as ineffective communication between implementers and end-users (Ajami & Bagheri-Tadi, 2013). There is therefore a recognized need to examine and review implementations of digital transformation interventions in healthcare, in order to prolong sustainability and promote efficiency in implementation processes. The study further demonstrates how the Consolidated Framework for Implementation Research (CFIR) provides a structure which can be used to advance and ensure effective implementations of digital transformation interventions in healthcare, and the findings can serve as a guide on how to improve digital transformation in healthcare. Principally, the CFIR can serve as a foundational framework prior to the development of an intervention, during, or, as in this case, after (Rodriguez et al., 2017; Soi et al., 2018).

The implementation process that has been evaluated regards the implementation of an intervention which was described as a digital healthcare service offering an alternative for physical patient meetings with citizens and patients of the region in the north of Sweden. The case study included a qualitative interview study based on the five domains of the CFIR framework, which are: characteristics of the intervention, inner setting, outer setting, individuals involved, and implementation process. The interview study included respondents involved in the actual implementation, as well as a nurse and a patient with many years of experience of the intervention. The gathered data material was followed by a data analysis, also based on the CFIR framework, in order to find patterns in the material. The research questions of the study were: (1) “what are the success factors in implementations of digital healthcare intervention projects?”, and (2) “what are the challenges in implementations of digital healthcare intervention projects?”. The research questions are considered as answered as we, based on the analytical process followed by the interview guide, identified a number of factors of both success and challenge. Factors of success of the implementation process included involvement of caregivers and care units, support, and, surprisingly, the effects of the Covid-19 virus pandemic. Factors of challenge included lack of involvement of end-users and individuals from the post-management of the implementation, decision-making, amongst others. Some of the identified challenges also demonstrated a deficiency of structure, which clarifies the importance of the usage of a structured implementation framework such as the CFIR. Generally, it was reckoned that many of the respondents did not have adequate knowledge on the CFIR, thus, we suggest that standard models like the CFIR among others should be known by developers of digital interventions so they will be guided in the selection of the items that make up an intervention. It is also recommended that the CFIR framework should be translated into local dialects so that diverse stakeholders can appreciate the various domains with ease.

This study offers valuable contributions to practice, policy and research. In terms of practice, it offers valuable contributions to the northern region in Sweden which is the organization the case study was conducted at, especially when it comes to the implementation of the studied project. In terms of policy, the evaluation of the previously conducted project will contribute to improving and streamlining future project implementations. Within the region, but also within other similar organizations as well.
Connected to this, it also offers valuable contributions to organizations interested or already active in the usage of the Consolidated Framework for Implementation Research, with our suggested alterations of the framework of particular importance. And finally, in terms of research, it offers contributions to the implementation research, especially in the field of digital transformations in the healthcare context. Our findings can be used to guide other researchers interested in the field of digital transformation in healthcare. We also hope that the study can be of interest for researchers interested in implementation frameworks such as the CFIR.

Nevertheless, even though we do consider that the study has valuable contributions, it is also important to consider its limitations as well. For instance, the study is based on a case study including a limited number of interviews and respondents. For that reason, we recommend further research on the subject, including more respondents, in order to increase its generalizability. Further, we recommend on doing similar studies by applying the CFIR framework on studies not only in the context of healthcare, but other contexts as well. This study also exclusively focused on the summative evaluation of an implementation process. A suggestion for further research is therefore to do a longitudinal study, where the focus is on the entire process, that is, on the beginning, the middle, and the end of an implementation process. Lastly, as this case study focused on a specific case of an implementation of a digital intervention that was perceived as very successful among all respondents, another suggestion for additional research would be to examine a similar implementation process of an intervention not perceived as successful, in order to see if the results would be of similar character or if the results would be completely different.
References


Business Model Innovation in Healthcare and Hospital Management. Cham: Springer. https://doi.org/10.1007/978-3-319-46412-1_4


Appendix 1: "Suggested steps/timelines of implementation"

<table>
<thead>
<tr>
<th>Implementation steps</th>
<th>Estimated time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agree to use a particular module (intervention)</td>
<td></td>
</tr>
<tr>
<td>2. Contact vendors of the module</td>
<td>Start time is after confirmation of access to reports for frontline staff</td>
</tr>
<tr>
<td>3. Identify multidisciplinary team members to serve as change agents</td>
<td>Within two weeks</td>
</tr>
<tr>
<td>4. Review reports from the team</td>
<td>1st month</td>
</tr>
<tr>
<td>5. Complete self-assessment</td>
<td>1st month</td>
</tr>
<tr>
<td>6. Pilot the report with data</td>
<td>2nd month</td>
</tr>
<tr>
<td>7. Validate data</td>
<td>2nd month</td>
</tr>
<tr>
<td>8. Agree to use reports/implementation strategies</td>
<td>2nd month</td>
</tr>
<tr>
<td>9. Create report/meeting strategies</td>
<td>2nd month</td>
</tr>
<tr>
<td>10. Pilot all reports/meeting strategies in one unit</td>
<td>2nd month</td>
</tr>
<tr>
<td>11. Ensure implementation strategies are carried out</td>
<td>3rd-4th month</td>
</tr>
<tr>
<td>12. Develop plan and implement new strategies in all units</td>
<td>4th-6th month</td>
</tr>
<tr>
<td>13. Review the rate of progress</td>
<td>As required</td>
</tr>
<tr>
<td>14. Sustain the effort</td>
<td>End of 9th month-12th month</td>
</tr>
</tbody>
</table>

(AHRQ, 2017)
Appendix 2: "Extract from the analysis phase"

<table>
<thead>
<tr>
<th>Data</th>
<th>Codes (constructs of the CFIR)</th>
<th>Themes (domains of the CFIR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Concerning the patients also, we have long distance patients in this region, so it’s extremely far and difficult for some patients to travel from their homes to the healthcare center. [...] And so, if it's possible for a patient to meet a doctor or a caregiver in the comfort of their homes or their offices, they find that to be more convenient”</td>
<td>Relative advantage</td>
<td>Characteristics of the intervention</td>
</tr>
</tbody>
</table>
In terms of contributions, both researchers have equally been involved in the thesis process. When it comes to the written word, all parts have been written together as a team. This means that both authors have been involved in the entire writing process, but also continuously discussed and contributed with ideas of text in all the sections of the thesis.

In terms of additional activities to the thesis work, this includes meetings and contact with both the supervisor and the representatives from the organization the case study was conducted at. Both researchers have been present and active at all meetings, and Stina has handled the notes for the meetings as well as the contact with both the supervisor and the organization. Additional activities also include data gathering. The data gathering was divided equally, thus, three of six interviews were conducted and transcribed by David, and three by Stina.