UiT The Arctic University of Norway

School of Business and Economics

# Responsible diffusion of digital innovation

*Diffusion of digital healthcare innovation responsibly in the healthcare system of Norway*

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# Abstract

Digital healthcare is an area, which is opening up for business opportunities. However, there has been a lot of research here from a long time. The involvement of stakeholders in the innovation process is increasing and with this situation, the diffusion of such healthcare innovation in market is evolving. To explain the effect of stakeholder's involvement in the innovation process on the diffusion of innovation in market, this research is organized. The master thesis aims to answer the research question " how a digital healthcare innovation can be diffused responsibly in Norway". In order to answer this main questions, three main questions are answered by the innovation study, market study and business plan. To elaborate the study, a case of digital healthcare innovation "Helseboka" is utilized in this thesis.

Helseboka is a mobile application that provides a holistic package of advance communication, data access and sharing and management features for patients and healthcare providers. This application is currently developed in Norway and passed the high procurement standards. The idea of the application initiated from the owners that are practicing doctors when they realized the problem of patients follow-up and communication gap between patients and doctors. The initiators have the vision to enable patients and doctors work as a team. The idea developed with the help of innovation Norway and the innovation process of this application matches the process of responsible research innovation. Thus, this case suited the context of research question and utilized further in this thesis.

The thesis consists of four chapters: introduction, innovation study, market study and business plan. Research question is presented in the introduction chapter; the theoretical frameworks and methodology that are utilized to answer the research question are explained in this chapter. The innovation study aims to define the innovative position and its impact on the healthcare system of Norway that is crucial for the next chapter, market study. The possible potential customers, competitors and market opportunities are discussed in the market study chapter by analyzing the internal and external environment of the selected project. A possible marketing strategy that comprises marketing objectives and activities is developed to ensure the responsible diffusion of Helseboka in Norway and international market. Finally the last

part, business plan that includes business model, financial and project plans elaborates the business decisions comprehensively to ensure the successful launch and diffusion of Helseboka in Norway and international market.

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# List of abbreviation

| | | |
|---|---|---|
| CEO | - | Chief executive officer |
| CPT: | - | world confederation for physical therapy |
| DALY | - | Disability Adjusted Life Years |
| DESI: | - | Digital Economy and Society Index |
| IPR | - | Intellectual property rights |
| NCD: | - | Non communicable disease |
| NOK | - | Norwegian kroner |
| PESTLE: | - | Political, Economic, Sociological, Technological, Legal and Environmental |
| PLO MESSAGES: | - | Pleie- og omsorgsmeldinger in Norsk means nursing and care messages |
| RRI | - | Responsible research innovation |
| SWOT: | - | Strengths, weaknesses, opportunities and threats |
| WHO: | - | World health organization |
| 4PS: | - | Product, price, placement and promotion |
| UIT | - | University of Troms |

# Chapter: 1

## 1. Introduction

***The role of digital health in healthcare system***

Digital health and its role in reforming healthcare systems and health service delivery has become a key agenda item for European health decision makers (Hamilton, Euro Health 2016). In the last two decades a wide range of digital communication systems have been developed in relation to health. As digital health services become more widespread, a holistic, public health approach to the design of future health systems becomes highly relevant in ensuring that solutions remain safe, accessible and affordable by all segments of the population (Euro health, 2016). Economic opportunities have been already identified by major venture capitalists in healthcare as investment in digital health has dramatically peaked over the last few years.

With the recent establishment of new global health targets under the sustainable development goals, universal health care (UHC) has emerged as a key area of focus. UHC encompasses three key concepts—equitable access, quality healthcare, and protection from financial risk (World Health Organization 2017). With higher standards of care almost universally available and resulting longer life spans and prevalence of more chronic diseases, there is a shortage of medical providers for the continuously larger surplus of patients (Patterson et al. 2012; Sheldon et al. 2008). Digital health bases itself on the implementation and leverage of information and communication technologies (ICTs) to deliver and scale healthcare to the masses. The healthcare system is at a turning point (digital health conference 2019, London). The healthcare industry is taking advantage of several digital trends in order to provide enhanced care to patients, while also trying to reduce costs. According to Federation of German Consumer Organizations 2016, 75% of patients support the digitalization in healthcare and 54% of patients are in favor of electronic patient health record.

***Towards a new healthcare paradigm***

The WHO (World Health Organization) Symposium on the future of digital health systems, which was hosted by the WHO's (World Health Organization) Regional Office together with the Norwegian Centre for e-Health Research in Copenhagen earlier in 2019, bought together 350 participants of member states and discussed trends, impacts and future directions of

healthcare digitalization. The key messages arising from this event were: (i) challenging role of digitalization in healthcare is driving a transition to predictive and preventative models of care. (ii) Comprehensive ability of digital health to disrupt health systems, service delivery models, healthcare processes and public expectations. (iii) Importance of digital health in achieving universal health coverage. The unique appeal of digital health lies in the potential to tackle entrenched inefficiencies in health systems and to create a new, tactile paradigm of health care – one in which individuals are empowered through choice; where health- related information is more accessible.

New technologies will continue to develop and impact hugely in the way people make health care decisions. Two main agendas of digital health world congress held on 27$^{th}$ & 28$^{th}$ November 2019 in London, were "closing the digital gap-shaping the future of healthcare" and "Design led innovation and patient experience". Digital health is thought to spark innovation in health care by providing better tools and solutions that empowers the end-users, patients and providers. Nowadays, e-mediated consultation and knowledge exchange by means of emails and other online conversation tools already plays an important role in facilitating modern doctor– patient interactions. Furthermore, consumer-driven, patient-centered ICT-based doctor–patient communication offers a new approach for empowerment and health promotion for consumers and patients.

***Diffusion of healthcare technologies***

The most commonly heard problem with embedding digital services in regular healthcare systems is that a large proportion of these services remain at a pilot or experimental phase, despite often positive results, and never make it to a larger implementation (Broens, 2007). To fully integrate electronic communication about and exchange of health information within current healthcare systems, constant adaptation of design, development, and evaluation of innovation requires skills from multiple professional disciplines. Assurance of health care technology satisfies safety and efficacy considerations are not sufficient. Rather, broader social issues associated with the uptake and diffusion of technology, such as cost effectiveness and distributional considerations need to be addressed to enhance the process of innovation design and implementation.

Interestingly, while there are several hurdles for innovation adoption including the nature of technologies themselves, regulation, cost, universal availability, culture etc., it could also an opportunity for innovators if they process and diffuse the innovation in a responsible way. Innovations created and diffused responsibly are inclusive of all the critical stakeholders (care providers, patients, administrators, entrepreneurs, etc.) and are more transparent and personalized. The author has focused in this thesis the digital heath innovations that how they can be responsibly diffused in the healthcare system and how they can strategically fit into the system.

Diffusion of healthcare technologies has to face some challenges and also it affects the healthcare system after adoption. These technologies are reshaping the contours of the health care landscape and dramatically altering the manner in which health care is sought, organized, delivered, and received (McKeever & Coyte, 2002). Although, such healthcare innovations yield universal gains to their adopters but still there are some intended and unintended affects of technology diffusion.

***Aim of the thesis***

The subject of this thesis is (i) to identify the challenges for the technology diffusion and adoption. (ii) Affects of stakeholder's involvement during innovation process on the innovation implementation. (iii) To explore the consequences to care recipients, consumers and society from the adoption of RRI health technology (iv) Finally, the aim of the thesis is to develop a framework by which the digital healthcare technology can be diffused responsibly into the healthcare system. For this purpose, the author selected a digital healthcare technology case to study the responsible research innovation process and its diffusion and adoption in the healthcare system.

The author used multiple theoretical frameworks through which research question is discussed. The thesis consists of four chapters; (i) introduction (ii) innovation study that provides valuable information about the technological features, its cost- effectiveness and its innovative position. (iii) Market study, which concentrates on market study of the selected healthcare innovation including internal and external environmental analysis and developing a marketing strategy. (iv) Business plan for launching and implementing the selected case in Norway.

Overall, the thesis develops the plan for responsible diffusion of healthcare innovation in the Norwegian healthcare system.

### 1.1 The research question

Research question is a particularly significant step in research as it narrows the research aim and objective down to specific areas, the study will address (Creswell 2014, Johnson and Christensen 2014). Without a clear, focused research question, it is difficult to know how or what to research (Grove et al 2013). Thus the author designed a research question to specify research aim and objectives. However, The subject of the topic is broad and exploratory. As qualitative research questions can represent broad or central areas of research or specific areas or sub-categories (Creswell 2013). Thus the author has designed a main research question of qualitative nature and whole thesis revolves around that question to find a suitable answer. The main research question is

*"How can a digital healthcare innovation that helps to store and communicate personal data be responsibly diffused in healthcare system of Norway*?"

Research questions are vital as they guide the choice of methodology, methods, sample, and data collection instrument and data analysis techniques (Lipowski, 2008). Therefore, the research question of this thesis guided the selection of methodology and data collection tools and strategies that would be discussed further in this thesis.

### 1.2 Importance of the topic

The topic of this thesis is "responsible diffusion of digital healthcare application that helps to communicate and collaborate between different actors in the Norwegian healthcare system" that applies the principles of responsible research innovation (RRI) and strategic fit. The importance of topic can be viewed from different angles (1) Need and importance of digital healthcare innovation, specifically mobile healthcare technology and their affects on the healthcare system. (2) Technological solution to bridge the communication gap between patients and the health professionals. (3) Responsible diffusion of digital health care innovation. (4) Responsible Diffusion of digital innovation in the health care system of Norway.

Digital health refers in different contexts to different activities including, among others, accessing electronic health records, consulting doctors by online, shopping online for pharmaceuticals, and blogging about illness experience (Segal, 2016, journal of healthcare

communications). Digital health technologies are described as promoting communication between healthcare providers and patients, encouraging lay people to engage in preventive health activities and improving patient adherence to treatment protocols and their self-management of chronic diseases. Today one can observe a greater commitment for networked, global thinking, to improve healthcare locally, regionally, and worldwide by using information and communication technology (Eysenbach and Jadad, 2001).

***Bringing the field forward***

Rapid innovations in digital health have fueled the use of mobile phones for delivering health services- a phenomenon called mHealth. With the emergence of smartphone technologies from 2006–2010, the field of mHealth entered a phase of rapid innovation. Mobile-cellular network infrastructure has seen an exponential growth in the last decade, reaching almost 95% of the world's population in 2016 (International Telecommunications Union, 2016). During the past, former US Secretary of Health and Human Services, Kathleen Sebelius, referred to mHealth as "the biggest technology breakthrough of time" and maintained that its use would also "address greatest national challenge" (Sebelius 2011; Steinhubl et al. 2013). Current mHealth strategies for health service delivery range from the implementation of simple text message reminders to complex clinical decision support algorithms, and extending in recent years to connect to sensors and other portable devices to aid diagnosis at the point-of-care (Labrique et al. 2013a). At their very core, mHealth deployments facilitate communication between patients and providers as well as within peer groups (Rotheram-Borus et al. 2012). Digitalization of healthcare empowers patients to shape and direct the technologies in their own interests (Bos et al., 2008). However, such innovative, disruptive and cost-efficient technologies would be the key to the future efficiency of the health care system and society.

***Changing role of patients in healthcare***

Traditionally, patients have been a passive recipient of healthcare, and have been a victim of the circumstances rather than a powerful actor, leading to one-way communication relationships between healthcare professionals and patients (Epstein et al., 1993). Vahdat et al. (2014) found that an effective relationship between healthcare providers with patients is an important contributing factor of patient involvement in decision-making. For patients' participation, mutual communication between the treatment team and the patient is necessary, so that information and knowledge could be shared between them, giving the patient a sense

of control and responsibility, and thus involving the patient in care activities (mental or physical), to benefit and rehabilitate from this involvement (Fleurence et al., 2014; Basch, 2013). Along with communication between healthcare members, the collaboration and data sharing and storage features are also important. In concert with this growth in infrastructure, ownership, and use, the rapid evolution of mobile devices has fostered new opportunities to address information and communication challenges that previously did not exist (Qiang et al. 2012). The ease with which patients can communicate and collaborate with health professionals provides greater efficiency and assist in lowering costs. The case of Helseboka that the author chose is the best solution for promoting communication between health care providers and patients.

***Relevance of RRI for digital healthcare***

When we talk about healthcare technologies, it needs to be clarified that these are responsibly created or they are inclusive all critical stakeholders in the healthcare system. Mostly the innovations come from technologists; health professionals or entrepreneurs and underrepresenting the patients that are the main users and their opinions should be valued. According to the predominant culture, research is performed on patients, not with patients (Thornton, 2014). Historically there is a great disconnect between those two polarized groups of people, and while physicians claim to embrace innovation, their ecosystem has great limitations to innovate in comparison to technologists and others. Thus the application of RRI principles make sure that all the important stakeholders are included in the innovation process. According to Asveld et al. (2015), the purpose of RRI is to assist innovators and producers of innovative products to determine and respond to public concerns when designing new technologies by involving a variety of relevant actors. The relevant actors include researchers, civil society organizations, industry, and policy-makers (Owen et al., 2012). Responsible digital technologies in the healthcare sector leads not only to technological development, but also to a change in the state-of-mind, a way of thinking, an attitude towards healthcare and role of different stakeholders in it.

The adoption and diffusion of innovations has been examined in multiple disciplines and from a variety of theoretical perspectives (for review, see Wejnert 2002, Strang and Soule 1998, Fichman 2004). But there is an emergent need to examine the adoption and diffusion of healthcare innovations in the discipline of responsible innovation RRI to clarify that how the

practices in the diffusion process are different for an innovation that is responsibly created. The author has explained in detail the RRI and the change in diffusion practices due to this process.

Lastly. There are unique technological, cultural and regulatory limitations for implementation of digital innovations that are specific to some geographical area. Therefore this thesis provides the overview of responsible diffusion of digital health care innovations in Norwegian healthcare system by keeping in mind all the unique limitations of the system.

### 1.3 Sub questions

There are three aspects that are necessary to answer the main question: innovation, market and business plan. In order to introduce the innovation (Helseboka), a feasible business plan is needed after careful understanding of innovation and market study. Thus, the first sub-question related to innovation study is:

*What is innovative position of Helseboka in digital healthcare system and how it positively impacts the health care system of Norway?*

By understanding the innovative position of Helseboka and the value propositions it can provide to its users, the author would be able to conduct market study.

So the answer of the next sub-question is depending on the information we discover here.

*Who are stakeholders for Helseboka and how to reach them?*

As Helseboka is a product of a private, profit seeking organization so we have to define the main stakeholders of the market of this digital app and discover the links to attract and convince them. Based on market study, a carefully designed market and business plan is needed to satisfy the interests of the stakeholders. Therefore next sub-question is related to the business plan.

*What is the suitable and feasible business plan to attract buyers?*

The business plan includes marketing strategy and financial plan to launch and implement Helseboka in Norwegian health system. Hence it provides answer to the main question of the thesis.

## 1.4 Theoretical frameworks

The case study aims to solve the `how `exploratory main question, which is further divided into three sub- questions. Therefore the case study is divided into three parts to answer each sub-question separately. (i) Innovation study, (ii) Market study and (iii) Business plan. The theoretical frameworks that serve the foundation for each sub section are discussed in the following section.

### *1.4.1 Innovation study*

Innovation study is important for the thesis as innovative type and value it provides, determine the market path and position of the innovation. Innovation study in this chapter uses five frameworks, the idea evaluation framework, four quadrants of innovation, and application analysis on health app by US FDA evaluation framework, cost benefit analysis of innovation and framework of Responsible Research Innovation. All players concede that innovation is of vital importance to organizations, economies, and to society as a whole. "Virtually all of the economic growth that has occurred since the eighteenth century is ultimately attributable to innovation" (Baumol, 2002).

According to Tidd, Bessant & Pavitt, (2005), whatever the dominant technological, social or market conditions are, the key to creating and sustaining competitive advantage is likely to lie with those organizations which continually innovate. There are some ways in which enterprises can obtain competitive advantage through innovation such as novelty in product/ service offering, novelty in process, complexity, legal protection of intellectual property, extending range of competitive factors an timing of innovation in the market etc. The idea evaluation is the first step in generating the sustainable business development model that supports creative processes. However, much of the literature on innovation is organization-centric, coming from the perspective of innovation management within organizations (Tidd & Bessant, 2009).

The high and rising costs of health care has prompted a wide variety of cost-containment efforts in both the public and private sectors. The challenge is to determine which innovations are effective and under what circumstances and then compare alternatives in terms of costliness, to assess relative cost effectiveness (warner & Hutton, 1980). To identify and convey the meaning of cost- effective innovations, evaluation technique called cost- benefit analysis is used in this thesis. Cost-benefit has come to refer to formal analytical techniques for comparing the negative and positive consequences of alternative uses of resources.

Not all innovation spaces are the same and depending on a point of view and approach to the new product development process, researchers, over the years, have ended up with the paradoxical creation of different typologies for same degrees of innovation and same typologies for differing degrees of innovation (Garcia & Calantone, 2002). For the purpose of this thesis, we have considered an innovation framework- four quadrant of innovation. The classical four quadrant of innovation is relevant and referred by recent literature such as christenesen (1997) and carpenter (2009). Christensen (1997) suggests that the technology either disrupt or sustain the industry, thus creating a new market or sustaining an existing market. Correspondingly, Carpenter (2009) added the challenges and strategies that can be applied to each quadrant. By combining Christensen (1997) and Carpenter (2009) views, an enhanced version of the classical four quadrants is presented in in the figure below.

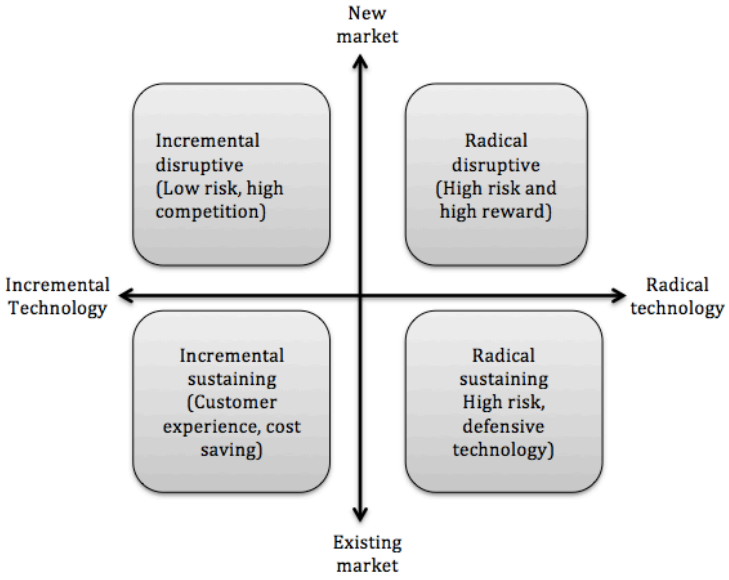



Figure 1: *The four quadrants of innovation, adapted from Christensen (1997) and Carpenter (2009)*

Radical disruptive innovation in this quadrant represents breakthrough innovation. It has opportunity to create its own market and have high risk, high reward possibility. It could make the innovation market leader if it remains successful. However, incremental disruptive innovation shows an existing innovation in new market. It has low risk but reward is also low and high competition. On the other hand, incremental sustaining innovation shows represent the existing technology in existing market. In this quadrant, innovation improves customer

experience and earns their loyalty and gains cost- efficiency (Christensen, 1997; Carpenter, 2009). The last quadrant is radical sustaining which brings new technology in existing market. It is a defensive strategy by offering the new technology in the existing to meet the changing market needs but it is associated with high risk as well. This framework helps to identify the position of innovation on the technological scale and at the same time the market choices and its effects. Another framework that is discussed in innovation study is related to Responsible Research Innovation (RRI).

***Responsible research innovation (RRI) concept***

RI (responsible innovation) can be considered as a tool for extracting and exploiting the best knowledge for innovation and for shaping research and innovation towards desirable innovation outcomes which are, socially, economically, and environmentally robust. To achieve this, purpose, process and outcome of innovation should be considered from the responsibility point of view (Stilgoe, 2012; Stahl et al., 2017). Main driver of RI is engagement that is related to the engagement of users, customers, relevant stakeholders, experts, policymakers, politicians and the public in the early stage of the research and innovation process by way of active and deliberate participation.

Owen al. (2013) proposed four dimensions of responsible innovation: anticipation, reflexivity, inclusion and responsiveness. Anticipation focuses on the idea or concept at very early stage of innovation and analyzes the critical issues and opportunities to increase the positive social impact of innovation outcome. Reflexivity means being aware of organization's limit of knowledge and paying close attention on value system and social practices in the innovation process.

Inclusion refers to involving different stakeholders in innovation activities in order to represent their ideas, creativity and voices. It opens a platform for dialogue and discussions between organization and different stakeholders that allows inviting and listening to wider perspectives from public and diverse stakeholders. Whereas responsiveness is related to adopting the deliberate attitude to reflect on feedback and demanded changes that shows care and respect towards stakeholders and societal values. Furthermore, a responsible attitude would build individual and collective capability to direct research and innovation towards the socioeconomic transformation of society (Voegtlin and Scherer, 2015).

The RI principles fits well with the innovation process and allows flexibility and prolonged design space for the innovation process. This method has proved to be especially valuable

under conditions of both technological and market high certainty. Such high uncertainty is often associated with radical and disrupting innovations (Christensen, Raynor and McDonald, 2015). Disruptive innovations, like those in the field of digital health/mobile health that are the topic of this thesis have the potential to change and challenge established systems and so it is important to ensure that these are designed and diffused in a responsible way. Thus this RRI framework fits well and can be extremely useful in the context of this thesis topic.

### *1.4.2 Market study*

Innovation study leads to the next step that is market study, in which we study the market and find suitable marketing strategy to reach the customers. For this purpose, first of all the analysis of customers and competitors is needed that define the targets and the existing competition in the market. Next suitable step would be the analysis of external and internal environment, which gives insights and understanding of the market conditions.
The customer analysis is done by customer segmentation on the basis of different needs and motivations related to each group of customers followed by the competitor's analysis by using the blue ocean strategy.

#### *Theoretical frameworks of innovation diffusion and implimentation*

#### *Blue ocean concept*

To identify the position of innovation in the market in comparison to industry, the blue ocean framework has been utilized in this thesis. The logic behind blue ocean strategy is the innovation with value: that it creates for the customers, neither following the competitors nor disputing same market, rather creating a new value for potential customers and creating a new source of demand. To achieve this, the blue ocean strategy aligns innovation with utility, price and cost. The strategic framework is, according to Kim and Mauborgne (2005), a diagnostic and action structure for setting up strong blue ocean strategies. Along its horizontal axis, the framework deploys a range of factors by which industries compete and invest and on vertical axis the level of supply available to customers over range determining factors. The final results portray the value curve that is a graphical representation of the performance of each innovation as regards to its competitive factors (Kim and Mauborgne, 2005; Sheehan & Bruni-Bossieo, 2015).

Furthermore, the analysis of external and internal environment is done, by using the PESTEL and SWOT analysis frameworks. PESTEL comprises analysis of political, economic, social,

technological, environmental and legal factors that is used for analyzing the external environment of innovation. In addition, SWOT analysis framework is utilized for internal and external analysis. SWOT analysis abbreviated for strengths, weaknesses, opportunities and Threats analysis that is used for matching the external opportunities and threats with the internal strengths and weaknesses of the business. However, internal and external analysis of the innovation, followed by the diffusion and implementation process of innovation by using different frameworks that are discussed further in this section.

***Roger's model of innovation diffusion and adoption***

After understanding the RRI and market environment, its necessary to understand the diffusion of the innovations for this thesis that is done by utilizing "Roger's model of innovation diffusion and adoption (1983)" and "strategic fit framework proposed by Ansari et al. (2010)". Rogers defines diffusion as "the process in which an innovation is communicated thorough certain channels over time among the members of a social system" (p. 5). Rogers's basic model focuses on and elaborates five sub-stages in the innovation decision process that can be characterized as process of innovation diffusion and adoption. Rogers (2003) described the innovation-decision process as "an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation" (p. 172).

First sub- stage of innovation diffusion and adoption is knowledge- awareness, which represents knowledge of innovation that accelerates diffusion of information and eventually motivate for adaptation of practice. The persuasion stage follows knowledge stage. Rogers states that knowledge stage is cognitive while persuasion stage is more affective/ feeling centered. Persuasion involves the formation of favorable /unfavorable attitude towards innovation. Next decision stage that involves user's decision to accept or reject the innovation. However, the implementation stage follows the decision stage where innovation is put into practice. Confirmation stage refers to the confirmation of already made decision. Depending on the support for adoption of the innovation and the attitude of the individual, later adoption or discontinuance happens during this stage. The innovation diffusion and adoption process along with other innovation characteristics and environmental factors, also affected by the adopter's characteristics. Rogers (2003) defined the adopter categories as "the classifications of members of a social system on the basis of innovativeness" (p. 22). For

Rogers, innovativeness helped in understanding the desired and main behavior in the innovation-decision process. The classification of adopters is shown in the figure below.

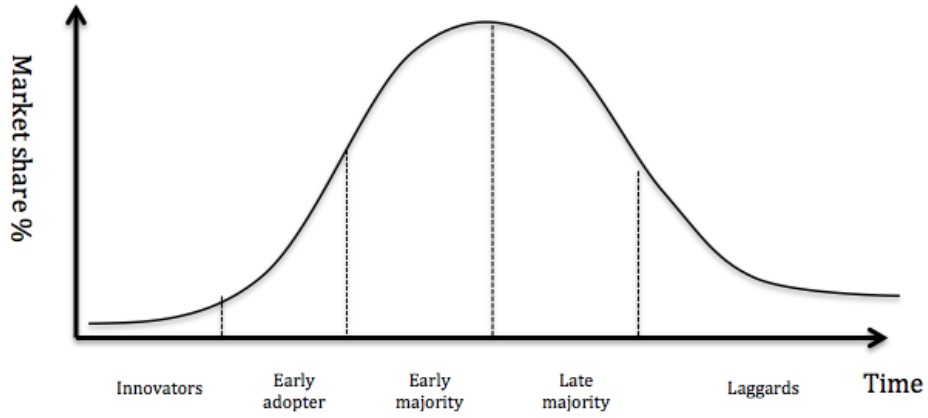



*Figure 2: Adopter's Categorization on the Basis of Innovativeness (Source: Diffusion of Innovations by Everett M. Rogers, 2003, fifth edition)*

For Rogers (2003), innovators are willing to experience new idea, while early adopters are more limited with the boundaries of the social system. Early adopters' leadership in adopting the innovation decreases uncertainty about the innovation in the diffusion process. Early adopters put their stamp of approval on a new idea by adopting it (Rogers, 2003, p. 283). However Early majority are not leaders but their interpersonal networks are important are still important in the innovation – decision process. While, late adopters are the majority that wait until most of their peers adopt the innovation thus they feel safe to adopt. Lastly, laggards adopt the innovation after looking the results of innovation successfully adopted. Rogers (2003) further described his five categories of adopters in two main groups: earlier adopters and later adopters. Earlier adopters consist of innovators, early adopters, and early majority, while late majority and laggards comprise later adopters.

***Strategic fit framework***

After understanding the diffusion and adoption process, it is necessary to understand the practice adoptions by using strategic fit framework proposed by Ansari et al. (2010). The framework aims to assist the decision of practice adaptation across the diffusion process. The framework consists of two key dimensions of adaptation, fidelity and extensiveness and three forms of strategic fit: technical, cultural and political fit by (Ansari et al, 2010). Fidelity is related to the scope and meaning of practice that is being implemented that how close or distance is this practice version as compared to previously adapted version of practice.

Extensiveness refers to the dosage of implementation that is close to notion of scale of implementation. The framework of strategic fit shows four patterns of adaptation associated with two dimensions of practice variability. “Full and true” adaptation characterized by high level of both fidelity and extensiveness means the practice is true all over the organization. On the other hand” tailored adaptation” occurs with low level fidelity and high level of extensiveness that means organization use much resources to implement an extensive version while implementing version that is significantly different from its previous version. Whereas, “low-dosage adaptation” involves high fidelity and low extensiveness that occurs when organization implement true but adopted on small scale. On the other hand, “distant adaptation” means both low level fidelity and extensiveness that occurs smaller in scope and deviates from previous version. The patterns of adaptation in strategic framework are shown in the figure below.

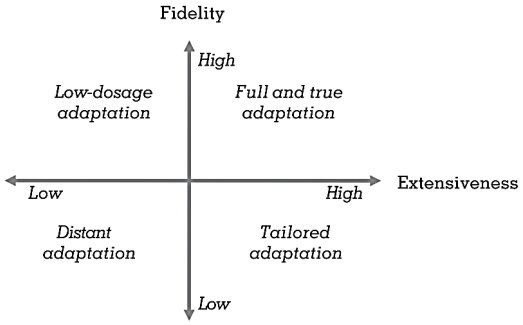



*Figure 3: Framework of strategic fit by Ansari et al. (2010)*

The key reason for organizations to adopt diffusion practices is that the characteristics of the practice do not fit with the adopter’s characteristics. A fit is the degree to which the needs, demands, goals objectives and/or structure of one component are consistent with the needs, demands, goals objectives and/or structure of one component (Nadler & Tushman, 1980:45). To conceptualize the fit of diffusing practices with adopter’s characteristics, we used Oliver’s (1992) categorization factors that affecting the organization’s practice as (1) technical fit (2) cultural fit (3) political fit. Technological fit means the degree of compatibility between characteristics of practice and technologies already in use by potential adopters.
Cultural fit characterizes to the degree of compatibility between characteristics of diffusing practice and cultural, values beliefs and practices of potential adopters. Political fit means the degree to which the characteristics of diffusing practice are compatible with the interests and agendas of potential adopters. Attention to political factors reintroduces issues of competition

and strategizing between interest groups for power, authority and leadership (carlile, 2004: Drory & Romm, 1990: Flingstien, 1996;Mayes &Allen, 1977).

***Crossing the chasm***

The last stage is developing the marketing strategy. For this purpose, the long-term and short-term goals are decided. Moreover, to meet these goals at different stages of the product/ services lifecycle, crossing the chasm strategy (Moore, 1999) is utilized. The strategy is developed specially for high tech products/ services and based on the classic marketing concept of marketing mix, product, price, placement and promotion. The core of the strategy is to cross the chasm; using appropriate marketing channels such as direct sales, pricing models, and customized solutions crosses first chasm. Moore, 1999, argues that most distribution channels can fall into two general categories: demand creators and demand fulfillers. The most effective channel for new technologies is the direct sales, which meant to be optimized for demand creation. Unless the product category is well defined and well established in the market, it is necessary to have a direct sales force out in the market to explain the benefits of the product. Conversely, retail sales channels are optimized for demand fulfillment. (Nielson, 2014).

The main goal of the strategy is to cross the chasm between early majority and late majority by using the marketing tools such as bowling alley and tornado and lead the market to mainstream. Bowling alley theory suggests accepting the possibility to reach different market segments and creating a leadership in that segment that would serve as lead pin for next segment. The main goal of this strategy is to create the set of bowling pin target markets for the business. The tornado is the time when business needs to scale up the exponentially in order to keep up the potentially increasing demand. Coming out the tornado to mainstream is period of relative calm for business. There are limited number of opportunities that are huge in margin are available. This is the time of continuous development of the product/ services to keep the leadership position by running ahead the competitors. Marketing strategy leads to the next step of business model development that is discussed in the following part.

### *1.4.3 Business plan*

The business plan is a formal document, which describes a good opportunity and outlines a strategic approach to pursue the opportunity (Richard C. Becherer & Marilyn M. Helms, 2009). Hormozi, Sutton, McMinn, and Lucio (2002) outline the essential elements of a business plan and agree that regardless of the size or stage of development, companies use a

business plan to improve their internal operations as well as to describe or market the business to outside investors. Struebing (1997) reported that the chances of success by companies undertaking major expansion or by those starting a new business increased by 50% or more if they first prepared a business plan. Researchers have supported a positive relationship between planning and firm performance and these strategic models typically support the preparation of a formal, written business plan (Rue & Ibrahim, 1998; Perry, 2001; Fletcher & Harris, 2002; Sahlman, 1997). Thus, the business plan is intuitively linked with improved performance.

Business plan section of the thesis is independent part that details the sections necessary to start and run the business. It includes parts from the innovation and marketing study and adds financial analysis and forecasts to determine the future of the business. Hence provides directions to the business and appealing to investors, partners that helps to expand the business in future. The business model canvas created by Osterwalder and Pigneur (2010) is utilized to explain the elements of business such as key partners, key activities, key resources, social value proposition, cost structure, relations, co-creators and outcome streams. Last part of the business plan explains the exit strategy and possible future risks for the business.

**1.5 Methodology,**

According to Creswell (2013) "a case study method is which (a) explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) overtime, (b) through detailed, in depth data collection involving multiple sources of information and(c) reports a case description and case themes". The aim of this thesis is to investigate the case in depth and generate intensive insight of the research question and case study research best suited for the accomplishment of required purpose as" case study is defined as an ideal methodology when a holistic, in-depth investigation is needed (Feagin, Orum, & Sjoberg, 1991)".

Case study research is particularly suited for looking at the phenomenon in depth and in context. Unlike experiments where variables are controlled, case study does not attempt to control the context (Yin 2009). According to Merriam (2009) and stake (1995) "case study research is seen as a flexible method". The author used interpretivism and inductive approach (Inductive research is, therefore, concerned with exploration and understanding) aims consistent with case study research.

Case study research is deemed suitable when the research is largely exploratory; and addresses the "how" and "why" questions (Benbasat, et al., 1987; Darke, et al., 1998; Yin, 1994). In this thesis, the main question that has to be answered is ‘how do’ that is further subdivided into three sub research questions to focus deeply into important areas as innovation study, market study and business plan. Thus, case study method is used in this thesis. Following the case selection strategy used for this thesis.

### *1.5.1 Case selection strategy*

Yin (2003) writes that a case study can contain either a single study or multiple studies. A single case study is useful when the research is highly exploratory (Benbasat et al., 1987). This concept matches the purpose of this thesis that is detailed, and exploratory study of the topic. Further, Dyer and Wilkins (1991) writes “single case studies are better when the researcher wants to create a high quality theory because this type produces extra and better theory”. When a single case study is used, the researcher can question old theoretical relationships and explore new ones because of that a more careful study is made. This makes also the researcher to get a deeper understanding of the subject (Dyer & Wilkins, 1991).
As an interpretive thinker, single case study suits the research perspective as well as research objective that may encompass such terms as explore in depth and understand and build a high quality theory. Moreover, the purpose of this thesis is to explore specific concept, “responsible diffusion of innovation” in-depth for which single case study is appropriate. However even if it is a single case study but the topic is discussed in the framework of responsible innovation and strategic fit that affect the case study.

The researcher can choose to make a single case study with embedded units. This means that the researcher is able to explore the case with the ability to analyze the data within the case analysis, between the case analyses and make a cross-case analysis. This gives the researcher the power of ability to look at subunits that are located within a larger case (Yin, 2003). Moreover, Seawright and Gerring (2008, p. 299) explain that a typical case study focuses on a case that exemplifies a stable, cross-case relationship. Because the typical case is well explained by an existing model, the puzzle of interest for researchers lies within the case. Specifically, the researcher wants to find a typical case of some phenomenon to better explore the causal mechanisms at work in a general, cross-case relationship. This description of typical case study fits research scenario. The question of how to diffuse healthcare innovation

in healthcare system of Norway shows the cross case relationship between digital innovation and existing health system in Norway. In addition, Gerring (2008) explained that by construction, the typical case might also be considered as a representative case according to the terms of whatever cross-case model is employed so in this thesis the Helseboka is the digital health representative case in the health system. The selected case is discussed in detail in the next section.

### *1.5.2 The Case (Helseboka)*

Helseboka is a new digital healthcare solution. It is a mobile healthcare application, developed by Norwegian actors, that helps to communicate, data access, sharing and management between patients and health professionals. It makes easier for patients to take control of their own health and for doctors to manage data on one platform. Best of all, the application provides everything you need in one place.

The idea originated back in 1987 by Anders Stormo, one of the owners of the company, during his exchange program in Singapore. But the work started seriously in 2017 when Marius Christensen and Anders Stormo, both are specialized in medicine and had their own clinics, realized the needs for health system collaboration that could make both doctors and patients better able to play in teams. They realized that for doctors, its challenging to manage and follow-up all the patients. Similarly, for patients, it was difficult to keep track of their health. Thus, they got the idea of health book in the form of app that could make it easier to follow-up for both parties. Before that, there was no such solution available, at least not in Norway and so the application was created.

Today the application provides the patients with all the important information pertains to them at one place. On the other hand, it enables doctors to manage and follow up their patients efficiently and provide better health care. Helseboka makes both patients and doctors better able to collaborate and play in teams.

The system is developed through engagement of all the concerned stakeholders. Throughout the process of innovation from idea to launch, the views, ideas and needs of different stakeholders are considered. The solution created and discussed with different stakeholders time to time and their feedback is taken and valued at every stage. The feedback from stakeholders is considered valuable and used to make necessary changes to fit the innovation with the actual needs. The innovation process of Helseboka has followed the four dimensions of responsible innovation that are anticipation, inclusion, reflexivity and responsiveness. Thus, the author chose this case to explain the diffusion of a RRI that is the main topic of this

thesis and Helseboka being a responsible research innovation provides the strong base for discussion and explanation of the thesis topic.

The application is ready to launch and the new features are added and improved continuously by testing it with customers. There is new feature addition almost every two weeks. Since, innovation Norway is funding a huge capital into this project along with other powerful and strong investors. Thus, it's easy to continue with further research and developments in the field. Detailed information about the case is provided in the appendix and other chapters of the thesis.

### *1.5.3 Strategy for data collection*

The strength of case study research is its capability of studying a research question or problem in depth and in context; therefore the data collection procedures should overall compliment this characteristic. Although case study research is sometimes thought of as being a research strategy that consists of qualitative data, this strategy can actually employ various data collection procedures for within-case and cross-case comparison (Dooley 2002).
Yin (1989, 1994) suggests three principles of data collection for case studies: (i) use multiple sources of data, (ii) create a case study database, and (iii) maintain a chain of evidence. Thus, the data sources for case study research, that Yin (1994) also suggested, are documentation, archival records, interviews, survey, direct observation, participant observation and physical artifacts. This thesis utilizes archival records, survey, interviews, direct observation and participant observation.

***Data sources used***

The interviews conducted for this thesis are semi-structured and unstructured, that left space for observation and judgment that is a main tool in qualitative research. According to Mason (2002), in qualitative data collection, interviews are usually semi-structured which means that they follow an interview guide but allows the flexibility and contextual adaptation. 'Merriam (1998) suggests conducting effective interviews, being a careful observer, mining data from documents as techniques and procedures that researchers need in order to become effective users of the collection tools. The interviews were collected in Tromso, Harstad and Oslo through various sources, on the phone, by online video call (Skype) and face-to-face. The interviews were conducted by the author herself and recorded by taking notes during and after the interview. The strategy to approach interviewees was taking appointments, where possible and luckily, author became successful in arranging meetings with the required persons. The

potential stakeholders considered for these interviews were health- related organizations and private organization, healthcare management and health personals. The author chose to approach the health care organization representatives as these organizations have more data, experiences and direct involvement and communication with patients.

In addition the questionnaire survey method was used to collect data from patients. The widely used method of survey questionnaire was also semi-structured allows flexibility and space for judgment. The questions were related to the case (Helseboka). Direct interviews with patients were not the priority for the author due to time limit and privacy issues. Online and direct survey was conducted with the patients. Besides interviews and survey, other data collected through documentation, archival records, and direct and participant observations. A characteristic feature of CSR, the collection of data using multiple sources for each case (Carolan et al., 2016), allows triangulation of evidence. Triangulation improves the accuracy and completeness of the case study, strengthening the credibility of the research findings (Cronin, 2014; Yin, 2014). The data was collected in different rounds that are elaborated in the table below.

| Round | Data sources | Data collection method | Data collection tools | Objective | Result summary |
|---|---|---|---|---|---|
| Round 1 | Interviews with the internal persons of Helseboka | 3 interviews, one on call, one Skype and one face to face | Open-ended interviews | First understanding of the case | The initiative of preparing market in Norway and application development continuously |
| Round 2 | Patients and general public | 50 surveys collected with general public in Tromso directly, 20 survey online from Oslo, Tromso and other cities of Norway | Semi-structured Survey questionnaire | Understanding the needs, motivations and challenges of this group of users | The digital mobile healthcare solutions with features available in Helseboka is the present need of the patients group |
| Round 3 | Healthcare workers and care givers | Interview with two health center nurses, interview with one care giver directly and one through online survey questionnaire | Open ended interviews, semi structured survey questionnaire | Understanding the needs, challenges of the targeted group and healthcare system of Norway | There is need for improvement in the existing healthcare system for efficient outcome. Helseboka meets maximum needs of this group of users. |
| Round 4 | Doctors: primary doctor and orthopedics surgeon | 2 interviews with doctors, one Skype interview in Oslo, one direct interview in Tromso | Open ended interviews | Understanding the healthcare system from the health professional's experience and identifying the needs of the system and users | There is a communication gap between healthcare professionals and patients and difficult procurement procedures |
| Round 5 | Business advisor, health professionals, researchers, health management people and other healthcare services providers | 2 Panel presentation, discussion and feedback from members | Presentation and discussion | Identifying the shortcomings of gathered information and knowledge and fixing the errors | There were some areas that needed more attention and work. |

*Table 1: Table 2: data collection rounds and methods*

### *1.5.5 Triangulation*

In purely qualitative studies, researchers may argue for the credibility and trustworthiness of their findings on the basis of triangulation (Robson 2002), such as interviews and focus groups. There are many ways of triangulation. Stake (1995) suggests that there are four types of triangulation, depending on the purpose of the triangulation: data triangulation, observer triangulation, methodological triangulation, and theory triangulation.
The author is using data triangulation for this thesis, since interviewing the same people again and again and using panel and other sources of data to answer the same questions. Three types of data used for triangulation in this thesis, primary data, secondary data sources and panel interviews to validate the data. Triangulation strengthened the research findings through providing corroborating evidence from the various sources (Creswell 2007).

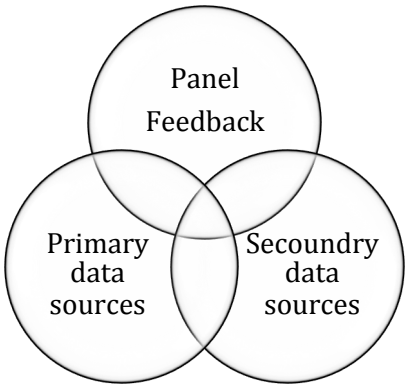



*Figure 4: Triangulation of data collected*

### *1.5.4 Data analysis*

For the purpose of analysis of data, inductive approach is used in this thesis in which we look into the data to see if there are common ideas and themes that emerge from data and which are supported by different data sets. The data analysis started immediately while we started data collection such as during semi-structured interviews, the author made notes and revised the interview questionnaire with time according to data needs. The data from innovation study and market study is used, analyzed and validated by triangulation of data.

For this thesis, data is analyzed in four phases, proposed by Miles and Huberman (1994). The four phases of data analysis are (1) data reduction, (2) data display, (3) conclusion drawing and (4) verification. The stages of data analysis are shown in the figure 5 below.

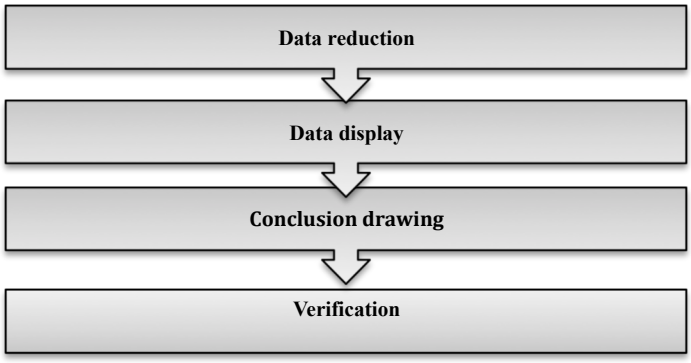



*Figure 5: Stages of data analysis by Miles & Huberman (1994)*

First, the load of data is managed by data reduction, by keeping the relevant data and removing the unnecessary information. Next step was to display the data according to themes. Moreover, after arranging the data according to themes and issues, comes conclusion drawing by using from the available data sets. Finally, the data is verified by using data triangulation. The conclusion from primary data sources and secondary data sources was presented in front of research panel and verified by their feedback.

### 1.6 Findings

An extensive body of research on the diffusion of practices has significantly enhanced our understanding of "how things-ideas and practices get from here to there" (katz, 1999:145). Taken together these bodies of literature offer a variety of rational, boundary rational and social explanations for the adoption and diffusion of practices across time and space (Greve, 1998; terlaak & Gong, 2008). On the other hand, there has been extensive concept development in responsible research and innovation (RRI) (Genus and Stirling, 2018; Stilgoe, Owen and Macnaghten, 2013; Owen et al., 2013; Ribeiro et al., 2018) but these discussions are not yet concentrated into a particular field; instead RI is a truly cross-discipline debate. Thus, There is need to explain the diffusion process and practices for the adaptation of responsible research innovations. Therefore, the author framed some questions to elaborate this direction of research in this thesis. The data from innovation study and market study is

used for the findings and to answer the framed questions. The framed questions and findings are elaborated in the following section.

***What is Responsible Diffusion of innovation (RDI)?***

Responsible diffusion of innovation holds-up the user's participatory approach during whole process of innovation development and implementation in the market. It makes possible maximum involvement of users, stakeholders, experts, policy makers and public from early stage of innovation process, during innovation diffusion and implementation. In RDI, the feedback from all different stockholders and at different stages of process is valued and used to modify or improve the innovation to make it according to real needs as much as possible.

***How does RRI affect the diffusion and adoption process of innovation / what is Responsible Diffusion of Innovation (RDI) process?***

According to Roger's basic diffusion and adoption model (1983), Diffusion is largely concerned with the marketing, dissemination and transfer of an innovation to end users and adoption is the process by which recipient users select and implement an innovation. We can simply translate Rogers' model into two phases,

(i) Mental transfer: the transfer of ideas, awareness and arousal of interest of potential stakeholders that is diffusion process

(ii) Physical transfer: the physical transfer of innovation by adoption and implementation of the innovation. If we apply, five sub-stages of the innovation diffusion and adoption process on a RRI. The model would look like this, shown in the figure 6, below.

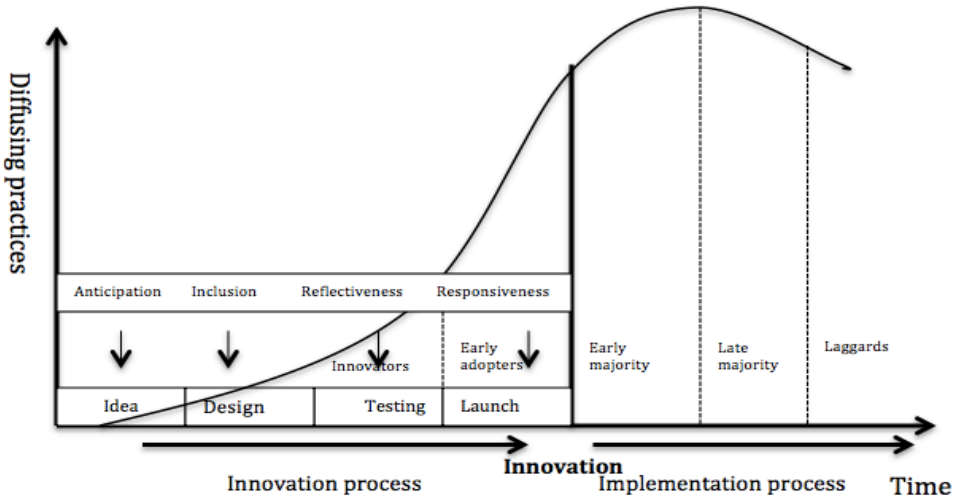



*Figure 6: Life cycle of diffusion process for RRI*

The life cycle of diffusion is longer than usual for responsible research innovations as shown in the figure 6, above. The reason behind this is, that diffusion of practices starts during the innovation process phase and continued to the implementation phase. Time on the horizontal side of the graph, represent the whole period of diffusion starting from idea _ final implementation of innovation outcome. Vertical side of graph shows the extent of diffusing practices.

The early two sub- stages of the diffusion and adoption process will merge with the dimensions of innovation process like inclusiveness and reflexivity that will trigger the diffusion process during the innovation process phase. In case of RRI, diffusion sub stages of mental transfer of ideas, knowledge and awareness to different stakeholders is done by collective deliberation from diverse stakeholders through dialogue, discussion and engagement during inclusiveness. Furthermore, inclusion and deliberative participation of different actors in the innovation process helps the development of perceived ownership of the innovation outcomes and motivates creativity (Ayuso, Rodríguez and Ricart, 2006).

Reflexivity is vital in building a stronger and sustainable alliance, partnership, or collaboration among different internal and external knowledge networks, and image and reputation among the customers and users (Stahl et al., 2013). That helps in marketing of the innovation idea through arousing interest and persuasion for innovation and creates an environment for the acceptance of innovation before the launch of final outcome. Responsiveness in the innovation process makes sure that ideas and feedback of the

stakeholders is considered and practice is modified accordingly to match their needs. Thus in case of RRI, at launch, idea is already introduced/ diffused among different stakeholders that makes the adaptation process faster as users that have already been engaged in innovation process, have less uncertainty and enough knowledge of the responsible innovation. Moreover, early adopters are mostly, the customers, before the launch of the innovation that use the innovation for free and the innovation uses their feedback for improvement before it goes in market for actual paying customers.

***How diffusion process differs for RRI as compared to ordinary innovation?***

Diffusing practices are likely to evolve during the implementation process, requiring custom adaptation, domestication and reconfiguration to make them meaningful and suitable within specific organizational contexts (Robertson, Swan, & Newell, 1996: strang & kim , 2004). This above mentioned process happens in ordinary innovation settings where the stakeholder's engagement starts at the launch stage of innovation but the evolution for diffusing practices may vary in the context of RI, where stakeholder's engagement and involvement starts from the evolution of idea and continued till end of the diffusion life cycle. Rational accounts point to the importance of uncertainty and associated mechanisms of learning (Banerjee, 1992; Bikhchandani, et, al.1998). In RI settings, early stakeholder's engagement provides more and early information about the utility of the practice that reduces its associated uncertainty and risk of adoption thus accelerates the diffusion process early. Social accounts emphasize cultural imperative for adoption. RI process affects the cultural compatibility and normative expectations of outside stakeholders. It causes a behavioral change in society; by involvement of stakeholders during innovation process thus increases social conformity that accelerates early diffusion and adoption of innovation.

According to Tolbert & Zucker (1983), early adopters are mainly concerned with the utility of practice whereas late adopters are concerned with conformity pressures in a rational to ceremonial shift. We used Oliver's (1992) categorization factors that affecting the organization's adaptation practice as (i) technical fit (ii) cultural fit (iii) political fit. We used three sub questions to further elaborate the answer of the above main question.

***(i) How RI affect Technical fit that result in different adaptation pattern?***

As technological fit, depends on the technical resemblance of practice characteristics with adopter's characteristics. The degree of knowledge of the diffusing practice is the key mechanisms that influence the adaptation practices. In RRI process, stakeholders are actively engaged in the innovation process. The inclusion process of RI provides a load of desired information during the innovation process phase. Moreover, practice is developed through close collaboration of different stakeholders in process that helps to design the practice compatible with the existing technological practices and makes it easy to adopt.

Thus, it reduces the misfit and uncertainty that affect the degree of adaption. Moreover, stakeholders are satisfied by the practice where their feedback is valued. This suggests the following proposition

**Proposition: 1**

"Close collaboration during the innovation process reduces uncertainty and increases knowledge about the practice that reduces technical misfit".

***(ii) How RI process affects cultural fit that result in different adaptation pattern?***

Conformity pressures are primary mechanism that affects the responses to a lack of cultural fit. RRI process trigger behavior change that help to diffuse new practices and ideas into the culture. During RRI process, on supply side, new innovation have opportunity to influence existing cultural norms and values through direct engagement with different stakeholders that trigger behavioral change and help to introduce new practices and ideas in to the culture. Secondly, on demand side, different stakeholders have considerable opportunity to discuss and share their local needs and values that works for them through active engagement. Thus they can considerably mold the innovation according to their local needs during the design process. These two factors reduce the cultural misfit for an innovation and help to diffuse the innovation fast. Accordingly, once the new innovation that has adopted some cultural norms and values and changed some behaviors now got proper social validation. It will be culturally legitimized and institutionalized. This suggests the following proposition.

**Proposition 2:**

"RRI process trigger behavior change that help to diffuse new practices and ideas into the cultural void and reduces cultural misfit".

***(iii) How RI process affects Political fit that result in different adaptation pattern?***

The adoption of specific practice may have significant consequences regarding power and resource allocation. Attention to political factors reintroduces issues of competition and strategizing between interest groups for power, authority and leadership (carlile, 2004: Mayes & Allen, 1977). On supply side, there are implicit and explicit normative claims of the practice. Thus the purpose of the innovation matters here. In RRI, the normative claims are mostly set by keeping in mind different stakeholders and discussed with them at early stage so if there any claims unacceptable by majority, these are changed accordingly. On demand side, organizational factors include formal and informal power structures, coalitions and resource dependencies that may trigger political strategizing and influence how innovative practices are received by the organization (fligstein, 1985: lounsbury, 2002: Tolbert & zucker, 1983). These factors are discussed during the innovation stage of RRI in which all stockholders share their feedback and practices are molded accordingly to reduce the political misfit that affect the adaptation pattern. These changes suggest the following proposition.

**Proposition 3**

"Close collaboration and involvement of political stakeholders in innovation process helps to mold the strategies and innovation accordingly that helps to reduce political misfit"

### 1.7 Discussion

This thesis answers the main research question "*"How can a digital healthcare innovation that helps to store and communicate personal data be responsibly diffused in healthcare system of Norway"*? The literature of diffusion and adoption of innovation shows the life cycle of innovation where innovation is presented in front of users when it is developed and ready to use then the diffusion and adoption process starts that involves, marketing and sale activities and then adoption by users. But the concept of responsible research innovation involves all stockholders from start of innovation process till implementation process.

The finding suggests that diffusion process of responsible research innovation is different from the traditional diffusion and adoption process. The life cycle of responsible diffusion of innovation process is longer than normal. In case of responsible research innovation, the diffusion process starts at early stage of innovation process and continued till actual adoption of innovation to users. It means users are engaged in the innovation process which not only helps to develop the innovation according to their needs but also helps to develop interest, awareness, emotional attachment and sense of ownership towards the innovation. The author

can name this concept mental acceptance/adoption of the innovation. The process of diffusion of responsible innovation can be divided into two parts, one mental transfer of innovation/ idea and interest and second physical transfer of innovation to the users.

For the purpose of this thesis, the author utilized dozen of theoretical frameworks to elaborate innovation study, market study and business plan of the innovation. Moreover, the author tried to collect data from different actors of the healthcare system and users. It includes the doctors, care professionals, care givers and patients and ensure that at least two members of each group should be present in the collected data to identify the needs and challenges of different stockholders. In addition internal data from selected case "Helseboka" was used by coordination of the company's management persons. Helseboka is a responsible research innovation as from start of the idea, the users and different stockholders have been engaged, their suggestions and feedback was used in the development of the application to meet the actual user needs and the above mentioned findings of the thesis has been proved by real activities happened in case of Helseboka innovation and diffusion process.

### 1.8 Limitations

However, the thesis was prepared within short period of time, less than six months. Thus, limited time reduces the number of interviews. Moreover, due to financial limits, the interviews with key persons were conducted by using video call application (Skype) and online survey questionnaire, thus there was no possibility of direct observations. Therefore, it was a challenge for author to involve maximum actors in limited time and with limited resources. Another limitation was contacting health professionals that were not easy because of their busy routine.
Furthermore, the author has a limited background in healthcare and ICT education, thus there might be medical inaccuracies in this research. However, appendices will provide maximum data and information regarding technical and medical areas.

In short, further research needed on the responsible diffusion of innovations into the market that will not only benefit the industrial sector but also would be beneficial for the society.

# Chapter: 2

## 2. Innovation study

This chapter aims to answer the sub question "What is innovative position of Helseboka in digital health system and what value propositions can be generated from this innovation?" In order to answer this question, the author starts with the explanation of the innovation properties and novelty. Furthermore, the author used different theoretical frameworks such as cost- benefit analysis, technological analysis to prove the value proposition of innovation for different stakeholders. In addition, an overview of the health care system of Norway and opportunities and positioning of "Helseboka" technology in the system is explained in this chapter.

Furthermore, the innovation position is explained by using practical framework for evaluation of health applications, enhanced version of four quadrants of innovation and framework of responsible research innovation (RRI) is discussed.

### 2.1 The innovation (Helseboka)

Helseboka Pro is a holistic application for advanced communication, follow-up and data management of patients and Health professionals. Basically it is a secure mobile record system for communication through which Patients and caregivers can communicate with therapists and Dialogue with several actors simultaneously including patient. On the other hand, for health professionals, it provides an information and data management solution, along with communication and journal system.

***Features provided by the application***

The main features of the application are patient dialogue, mobile journal system and customized solution. Patient dialogue, which provides facility of time booking, digital dialogue through e-consultation, and video consultation with drop-in function that linked to the schedule, prepaid consultations and receipt through application linked to the online banking.

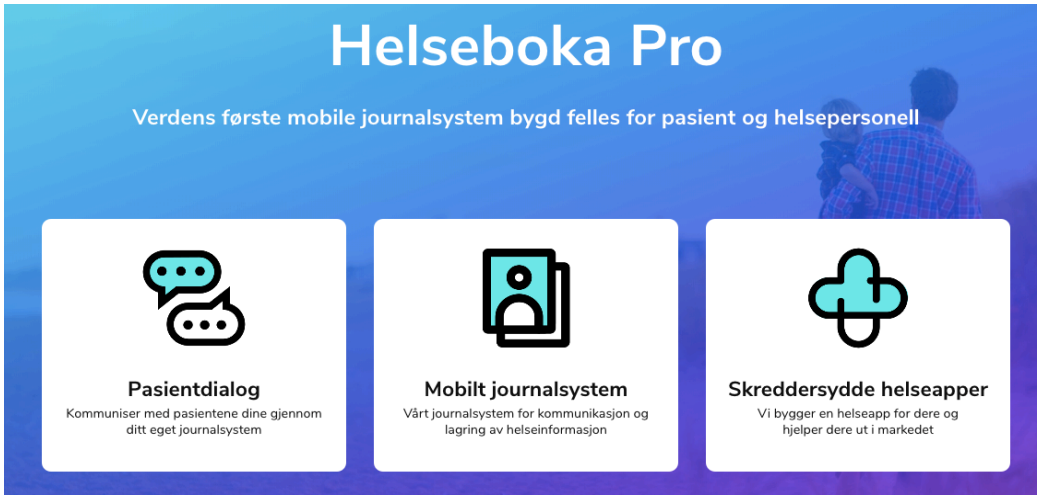



Figure 7: screenshot of user's features of Helseboka source: (https://helseboka.no/pro/)

Moreover, mobile journal system stores journal notes on limited number of patients, patient communication record, multimedia posts and consent. It provides front-page notifications about new events, view attachments stored on patient record. Dialogue function where both patient and specialist in the same record thread can be accessed later.

Check-in function provides e- diagnosis after obtaining consent and self-declaration. It includes integrated payment system where healthcare professionals can charge directly to patients and other members.

Another important feature is the customize option that is mainly for health professionals which enables user to choose graphics and color codes on their application itself. Moreover, it provides unique startup image feature for health professionals where they can advertise their affiliates and use the ownership of application. Another attractive feature is the link to user's own website to connect through the application. Moreover, It includes payment feature where information and messages are locked until user chooses to pay and view the message.

Similarly, in-check solutions where the health professionals can create their own form that patients and care givers have to fill out in advance.

However, there are much more features that are in development stage and would be available soon in the application.

***Application design and compatibility***

The application has a user-friendly design and compatible with existing devices and healthcare systems. Regarding the design and usage of the system, the system can be used as an app or from a web. It is compatible with IOS & Android devices and also available on web. There is separate but interconnected application for patients and health professionals that met their needs accordingly. Clinics, therapists and patients have unique systems that interact.

It has a responsive design, which means that it looks great with all different screen sizes. The system can be branded as clinics/ company's own system. The screen short of Helseboka, front page of web is shown in the figure below.

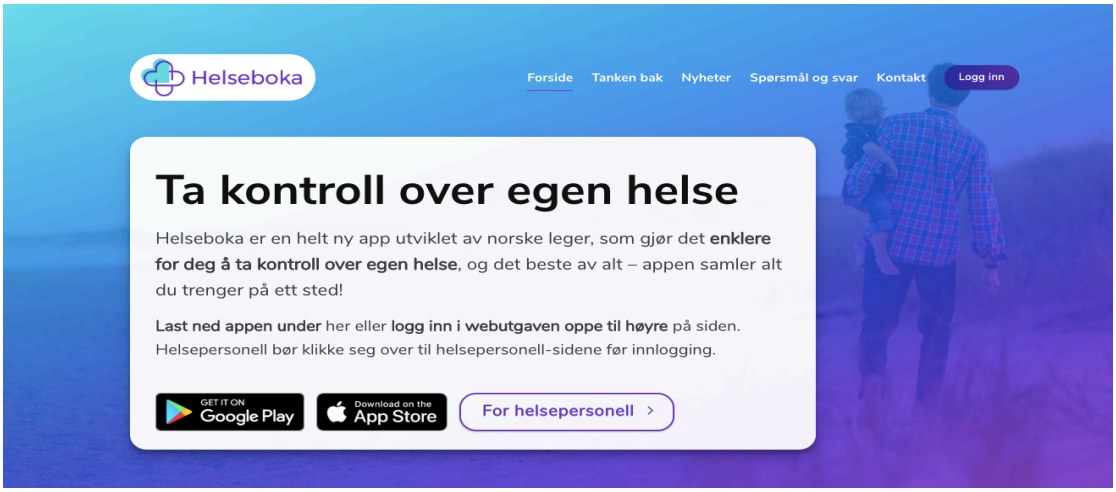



*Figure 8: screen short of Helseboka front page on web, source: (https://helseboka.no)*

***High standard security & Privacy***

The system complies with the highest standards of security by following both the Information Security Standard, ISO-27001 certification, and using Level 4 security for all patient communications. The security and privacy of the system is ensured and dealt with the unique handler form and login using Bank -ID. The system ensures obtaining consent and self-declaration from the patients For example, consent before treatment and self- declaration of health information. The record can be sent as a PLO message into another journal system. Moreover, The owner of the system can customize own consent and self-declaration on patients and send by SMS notification to patients. The unique login with bank ID uses level 4,securities. The patients can upload videos and pictures before hours that save consultation time.


*Figure 9: screen short of "overview of the security system" it uses, source: (https://helseboka.no)*

***How it links different actors/ how it works?***

It has taken a long time to establish communication with all medical records in Norway, but as a patient, one can now be sure that his messages reach the doctor. This means that one can send questions and prescription orders to his doctor. In no time one will also be able to pick hours for most of Norway's medical offices. The doctors can easily link their existing website or journal system with the application and patients would access the features from the clinic's homepage or even with the name of the doctor on the patient's application.

Patients just have to enter the name of the doctor in the required field and patient's request with unique Norwegian bank id and name goes to the doctor. The application has established communication with all medical records in Norway. If the doctor is also using the system, the message goes directly into doctor's medical record while in others, there will be a link to the doctor through secure message which allows the doctor to open start communication or access data.


Figure 10: screen short of "how it works" between different users, source: *(https://helseboka.no)*

***Affordable Pricing model***

The application can be installed free and it contains subscription for different packages. The user can choose the package according to needs and feasibility. The packages ranges from basic to full features. The user does not need to pay for the features, not required. The basic application is free for fastlege. Subscription can be cancelled when needed. The details about the mentioned qualities of the application can be found in the appendices section of the thesis.

## 2.2 The health care system in Norway

The planning of the Norwegian health system in principle is relatively centralized, most Provision tasks were transferred during the 1970s and early 1980s from the central to the county and municipal administrative levels, and it is the latter two administrative layers that

currently account for the bulk of health care expenditure. Its fundamental aim is to give all residents equal treatment. The primary care services are the responsibility of municipalities (Regard et al., 2012). Following the hospital reforms that took place in 2002. The specialist care has been the responsibility of state, which has been delegated to four regional health authorities. Regional health authorities oversee all hospitals in their region and led by an executive board, appointed by the ministry of health. Provision of health services is based on two main tiers: state owned health authorities and municipalities (local authorities (_Mørland et_al, 2010). Nevertheless, both the regulation and supervision of health care activities have remained the responsibility of the national authorities.

***Beveridge model of healthcare system***

The healthcare system of Norway fits in the description of "the Beveridge Model" of health care system. According to Beveridge system, health care is provided and financed by the government through tax payments (CESifo, 2008). The power is centered at the government level, controlling the costs and the actors in the health sector. It is a top-down system, where government instructs the providers of healthcare through different mechanisms, and the providers instruct the patients. There is also an insurance system, but it is an addition to the system, not central, and is used in varying degrees. The Norwegian health care system is mostly publicly funded. The central government provides grants to the counties who, in turn, finance the bulk of the hospital sector. The municipalities also receive grants from the central authorities, and largely fund the primary health care system. Finally, the state-run National Insurance Scheme (NIS), created in 1967, offers public insurance against individual medical expenses (fees for service) for ambulatory care provided by hospitals and private practitioners.

The Norwegian health care system is characterized by extensive coverage, high quality and proven medical competence. In an official opinion poll (NOU 1997:2), about 95 % of the respondents expressed satisfaction with the professional skills of their physicians and 80% gave a positive appraisal of the results of treatment and the service attitude of medical staff.

***Problems faced by healthcare system***

Although the performance of healthcare system is satisfactory and are according to international standards but a number of problems that needs to be addressed. First of all, the healthcare service in Norway unable to ensure speedy access to hospital care, which need

better planning and coordination of health care services. Moreover, there is increasing pressure of rising public health care spending. Second, the most urgent problem is the insufficient ability of both general and psychiatrist hospitals to absorb patient inflows. As a result, long waiting lists and reduced freedom of choice of hospitals by patients is widely unacceptable. The persistent of long waiting time damage the health of patients and require intervention to avoid serious consequences in the long run.

Another problem that is apparent in recent years is the lack of communication between health professionals and patients. Event though the government funds and recommends the necessary treatment which is financed by local taxes but still the patients have no influence or involvement in the decision making process of health care system There is an apparent need for an improved allocation of health care resources across regions, both in order to relieve existing capacity constraints and enhance the accessibility, quality and cost efficiency of services.

### 2.3 The impact of Helseboka on the health care system of Norway

Today due to advancement in technologies doctor patient relationships are changing. Helseboka can contribute to this radical change and can help to break established structures and practices that are a hindrance in the way of open and timely communication between patients and health care professionals. It can also contribute to new approaches in the healthcare and shifting the power balance in favor of patients where patients can communicate properly and can get fast access to their health records. It makes possible for the healthcare to take individual patient's goals, preferences and values into account. Digitalization increases the possibility of participation of all stakeholders and it makes possible to deliver higher quality healthcare for more people and for less cost.

Using Helseboka would make speedy access to health care and less waiting time-. The patients/caregivers can communicate with care providers from home and they do not need to wait for their turns in long queue.

On the other hand, after getting initial advice for serious matters they can arrange meeting online or can visit hospital. Patients can access digital records and as an informed player they can play their part in the decision making of their treatments and makes the process of treatment efficient by keeping the treatment and procedures on track. The figure below shows the expected impact of Helseboka on the health care system by portraying how it fills the communication and technological gap and act as a communication hub between patients and

healthcare professionals. It also empowers patients to involve actively in the decision making for their health solutions.

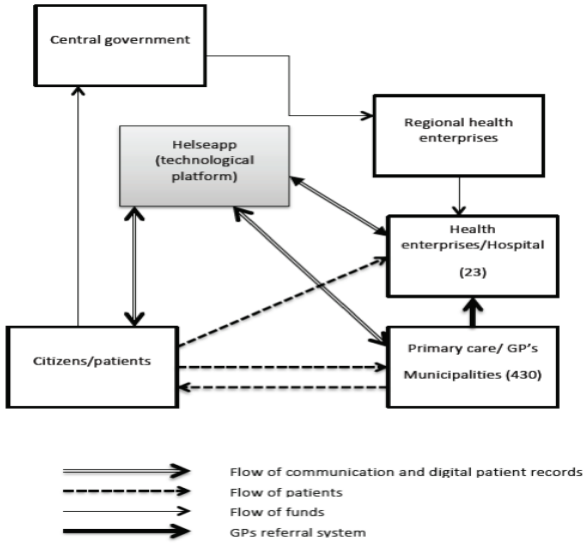



*Figure 11: The expected impact of Helseboka on the health care system adopted from ( Mørland et al., 2010, p.399)*

The figure above shows the communication flow between patients and healthcare professionals. The flow of information is fast and efficient that reduces the time and cost of healthcare along with empowering patients to participate actively in the decision making and be informed. Secondly, the flow of digital health records from health professionals to patients and its storage in the Helseboka as a unique personal data archive in which data is stored in patient's cloud provide timely access to the health records, sufficient patient engagement and on time reporting of health events and treatments. It will also help to get health system feedback from patients and caregivers to improve planning and management of healthcare system.

Overall, this innovation directs the system towards "one patient-one record" that is the future goal of healthcare system of Norway.

**2.4 Novelty and intellectual property protection**

There are numerous health- related digital communication platforms available. It's the world's first mobile integrated/combined patient and health care professional health journal, communication and management solution.

Helseboka is an innovative platform that provides novel service in the form of content and features of the app. It provides a combination of all the required healthcare features at one place. Moreover, it is a unique platform that secures the data and sharing of data that meets advance and high security standards in the form of self-declaration and consent form as well as using level 4 security. It stored information in the patient's own cloud that is protected by ID and cannot be accessed without consent but patient can share it with other therapists.

As a health mobile application, the intellectual property protection could be in the form of trademarks and copyright. A patent for innovation is protecting Helseboka, being a radical innovation. Trademark is obtained for the design and specific symbol as logo for identification of company and innovation. The copyright protection has been obtained for the content, data and layout of the app. Thus basically, intellectual property rights that protect the content from being copied protect the innovation itself and its content.

### 2.5 Cost- benefit analysis of the innovation (Helseboka):

Technologies are extolled for saving lives, improving health status and improving quality of care and life. At the same time new technology implementation in healthcare escalates the medical costs. A growing array of technologies will claim an increasingly large share of resources. So, every new technology has to justify their costs in the climate of competing claims on resources. Cost-benefit analysis of new medical technologies often is useful guides to their potential in health care. It is also appropriate criterion for guiding the adoption of new technologies. But the question is to measure the cost of technology that is contributed to increasing costs. Another caveat is that the impact of technology on health care costs is much broader than the purchase and maintenance price and may include induced and indirect costs. Similarly, technology implementation has wider range of direct and indirect benefits. Benefits will also be measured here in terms of improvement in service coverage.

#### *2.5.1 Cost- benefit analysis for users and benefactors*

As Alange and Lundqvist (2014) propose, an innovative idea has different values, depending on the situation of use. Thus, this innovative solution generates values not only for customers or the users but also the society. The author performed a cost- benefit analysis of innovation from both a healthcare system and societal perspective. The healthcare system is divided into three groups, patients, doctors that are direct users of the platform and healthcare management as benefactors for cost-benefit analysis due to different value propositions and costs for each

group. All of these groups are important for entry and survival of innovation (Helseboka) as benefactors provide funding and the users contribute to the operation and acceptance of the system. Thus it is crucial to focus on all groups and provide specific cost-benefit analysis for each group, provided in the table below.

| **Cost- benefit analysis for patients** | |
|---|---|
| **Benefits** | **Costs** |
| Service benefits<br>• Personal health tracking<br>• On time access to health provider<br>• Easy and active digital data access, sharing and storage<br>• Decision support to patients<br>• Increased medication and treatment adherence<br>Time & cost saving<br>• Cost of adaptation/ implementation is less as no special setup needed<br>• Saves time and transportation cost of hospital visits<br>• Reduced waiting or consultation time | Direct costs<br>• Mobile phone access and provision<br>• In-app package purchases<br>• Cost of getting data access and sharing<br>Indirect costs<br>• Opportunity cost of direct interaction with doctor |
| **Cost-benefit analysis for healthcare providers** | |
| Healthcare service benefits<br>• Scheduling and active work planning<br>• Easy management of patient's data<br>• Work efficiency<br>• Remote monitoring of patients<br>• Increased knowledge transfer among practitioners<br>Indirect effects<br>• Better Performance feedback<br>• Increased patient satisfaction<br>• Decision support<br>•<br>Time & cost saving<br>• No extra machinery installment needed<br>• Digital Management cost is less than manual handling costs<br>• Time saving from administration tasks | Direct costs<br>• System ownership and acquisition cost<br>• Package costs<br>• System adaptation cost (system diffusion or replacement cost)<br>Indirect costs<br>• Time and resource for learning application usage |
| **Cost-benefits analysis for healthcare management** | |
| Service improvement<br>• Better planning and coordination<br>• Improved hospital image<br>• Decrease in billing error<br>Time & Cost saving<br>• Reduced costs of manual handling<br>• Reduced costs of data sharing | Direct costs<br>• Acquisition costs<br>• Future upgrade costs<br>Indirect costs<br>• Time and resource for training |

*Table 3: Cost- benefit analysis for Helseboka*

Beside medical effectiveness, patient's empowerment is a significant benefit in healthcare. The main benefits for patients as shown in the table above are service benefits and time & cost savings. Service benefits include the personalized healthcare for all patients. Health tracking and informed decision making by getting reminders about health related events and active communication with doctors are also service benefits. Moreover, the benefits related to digital communication and coordination solution that improves the lives of patients and caregivers by providing them timely access toward their care providers and also access to their health records. This mobile health application decreases the travel time and cost of transportation. On the other hand it reduces the waiting time because of less number of patients. Direct costs for patients include in-app purchases such as payments for data access and sharing. While induced costs are mobile phone and Internet access, digital training and missing satisfaction by visiting doctor personally. Benefits availed by patients through using this innovative solution is much higher than the costs for adapting the solution.

On the other hand, the value for health professionals /doctors is to provide them with adequate planning and coordination of treatments, communication and performance feedback from customers. Similarly, the technology usage reduces cost and time of appointments. It provides "one patient-one record" that makes easy management of patient's data and remote monitoring of patients for doctors that in turn enhances the work efficiency and time saving. The health professionals can use Helseboka for communication and data sharing with other practitioners. Thus, it increases the speed of knowledge transfer and communication among health professionals. The direct costs for doctors are system ownership and package costs and induced costs include system adaptation and training costs. It is a cost-effective technology for doctors because benefits are much higher than costs attached for technology implementation.

Finally, the benefits for healthcare management are that it improves overall planning and coordination of healthcare. It reduces the costs of data sharing and manual handling as staff costs for appointments and support and reduces the billing error. It improves the hospital image that directly impacts the users choice and revenue. As compared to benefits, the costs such as direct costs are system acquisition and maintenance and indirect costs of training and adaptation of system are low as compared to other competitive systems.

Overall, Helseboka is a cost-effective digital innovation for the healthcare system so it is highly recommended for both private and public users. In case of private hospitals and

doctor's clinics, where same person are health professionals and management team, the benefits and cost of health professionals and management accumulate for them but still provide them cost- effectiveness.

### *2.5.2 Cost-benefit analysis for society*

| **Cost-benefit analysis for society** | |
|---|---|
| Benefits | Costs |
| Health benefits<br>• Improves quality of health care for society<br>• Healthcare efficiency<br>• Improvement in society's health<br>Service efficiency<br>• More efficient access to healthcare for special groups (disabled, addicted, chronic disease patients etc.<br>Cost saving<br>• Reduces cost of healthcare for Society | Direct costs<br>• Tax contribution to healthcare<br>Indirect costs<br>• Cost of creating awareness<br>• Behavior change |

*Table 4: Cost- benefit analysis of Helseboka for society*

The Helseboka allows the patients to be involved and informed about their healthcare decisions thus empowers the patients that improve their lives. The involvement of patients in decision-making improves coordination and planning in healthcare that contributes to the improvement of overall healthcare towards society. Helseboka provides the opportunity for patients to communicate and discuss health conditions directly and on time with healthcare providers. Thus involved patients can play an active role in healthcare system that transform indirectly into healthy society.

Helseboka has the potential to reduce the cost of healthcare. However in Norway, the cost of healthcare is the responsibility of the government and the government covers the cost by public taxes thus Helseboka lower the cost of healthcare and reduces the burden on society. By implementing the radical features of innovation such as data storage reduces the cost of record sharing, transportation costs from distant areas. In addition, it reduces the number of patient's visits and saves the unnecessary costs related to administrative tasks.

## 2.6 Practical framework for evaluation of health apps (Helseboka positioning)

In the healthcare system, picking the suitable app is difficult because of evolving evidence, emerging privacy validity and usability risks. To help guide selection, the author used a unique app evaluation framework, pyramid for health app evaluation framework by US, FDA (Food and Drug Administration), for rating the app that is mapped onto five priority level,

reflected in the APA app evaluation framework and consensus statement. The framework has adopted a broad stakeholder analysis approach involving integration of both healthcare system and patient perspective.

The sheer number of App evaluation frameworks is available but most of them focus on ease of use and short-term usability but do not devote attention on privacy, evidence and clinical integration. On the other hand, some of them focus on validity, privacy while ignore other factors. This framework provides a coherent solution for evaluation by reducing, simplifying and presenting the core elements. The benefit of this framework is that it provides a synergic product that can be useful across diverse health conditions and stakeholder groups.

The goal of this evaluation is not to pass judgment or offer reductionist scoring but rather to ensure that users are aware of what the app is doing to be able to make an informed decision. This framework focusing on informed decision making of the state of app safety, evidence, usability and integration rather than anchoring to any single fact.

Thus, this framework with universal standard for evaluating health apps captures full range of important aspects to consider is the best app evaluation framework for evaluating "Helseboka" that itself is an application, which meet all the standards of evaluation shown in the figure below.

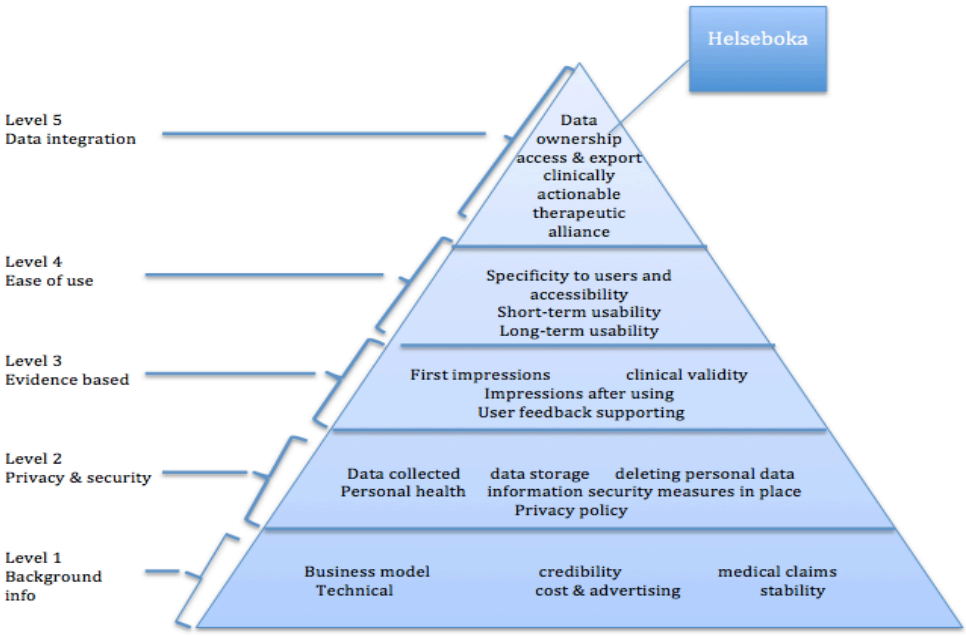



*Figure 12: Pyramid for health app evaluation framework by US FDA (Food and Drug Administration)*

The innovation Helseboka is at data integration level 5 of the app evaluation framework pyramid. It provides background information to users, passed the second level of security and privacy standards according to healthcare rules and regulations of Norway. The system provides validity and supporting feedback from users. The application is user-friendly and designed specifically to meet the accessibility needs of users. Finally, the highest level of ranking, data integration is met by providing data ownership to users in the form of unique cloud data for patients and can be shared by consent to other professionals. On the other hand, system can be customized and ownership of the system could be transferred to the users in the health care system.

### 2.7 Competing platforms

Normally, when we start searching for communication and data sharing solution between health professionals and patients, many popular applications appear on top of search engines. Internationally, there are several such systems that provide single specialized solutions as web text, siren MD, Athena well can be used for patient and health professional's online communication. Similarly applications for secure data sharing such as MIM cloud, PHT system etc. Nevertheless, none of them provides, the whole package of solutions in one application that is the requirement of Today's health system. Similarly, there are many solutions in Norway that are used for meeting these single functions such as Patient sky, Eyr, Kry used for communication in healthcare system and Accenture, Dig post etc. applications can be used for data sharing. On the other hand, Helseboka has competitive advantage over the holistic solutions available internationally and locally in Norway. It provides e-diagnosis solution in addition to communication and data sharing function and many more features that are not available in other applications. The system can be replaced easily or integrated into the existing system without extra efforts. In Norway it is the first mobile application that provide all the solutions at one place.

The table below shows the comparison of features provided by Helseboka with other application available globally and in Norway.

| Patient centric global healthcare applications | | | | | Patient centric Norwegian healthcare applications | | | |
|---|---|---|---|---|---|---|---|---|
| **Application features** | **Helseboka** | **MD click** | **Genie MD** | **IMQ** | **Helserespons** | **KRY** | **EYR** | **Helsenorge** |
| **OS compatibility** | IOS, android & web | IOS & android | IOS & android | IOS | IOS & android & web | IOS & android | IOS & android | IOS & android & web |
| **Focus** | Mobile solution for communication, data sharing, data storage, appointment booking and record keeping and management for doctors. | Tool for data sharing and care integration between care professionals | Care team feature to securely communicate, maintain and share personal health records for both patients and health professionals | Share reports with patients, notify appointments, video consultations | Online solution for patient dialogue, digital mail and online timetable | A solution to book a video appointment at convenient time and place | See the doctor online and appointment booking | Patient journal for data storage and sharing, and can send message or book appointments |
| **Online messaging** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ |
| **Video conferencing** | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✗ |
| **Video-consultation** | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | ✓ | ✗ |
| **Time booking/ Reminder** | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Data sharing and storage** | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ |
| **High level security** | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | ✓ |
| **E-diagnosis** | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ |
| **Integrated payment system** | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ |
| **One patient-one record** | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| **Customization of solution** | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |

*Table 5 Comparing Helseboka with potential global and Norwegian competitors*

The table above shows that Helseboka provides all the required healthcare features at one place in comparison to other applications that provide limited features, such as one-patient-one record and solution customization features are totally new and not provided by any application before. Moreover, integrated payment system is only provided by two other applications that are not providing data access and sharing features. However, Helseboka provides fast data access and sharing features as compared to all other applications. Similarly, most of the applications provide only basic communication features and have lack of advance communication services as compared to Helseboka.

Overall, Helseboka is an application that has competitive advantage of providing advance communication features, fast data access and sharing, E-diagnosis and data management functions all in one place as compared to other competing platforms.

## 2.8 Positioning of Helseboka in innovation frameworks

### *2.8.1 the four quadrants of innovation*

Innovation may be generally categorized as product, process and administrative (Tidd, 2001). Others classify innovation by regional influences (Evangelista, 2001) or decision criteria (Rogers, 1995). Helseboka is an innovative solution in digital health for communication and coordination between different stakeholders in the healthcare system. It is the first digital solution in Norway that makes possible fast sharing of digital health records and communication between different health actors through a secured platform.
It is necessary to determine the innovative position of Helseboka as it influences the marketing strategy and business plan which is required for launching and survival of the innovation in the market. Integrating numerous past studies on technological innovation especially those Abernathy, Anderson, Clark, Tushman, Christensen (1997)& carpenter (2009) produces a common framework distinguishing four generic types of technological innovation. These four types of innovations differ by degree of newness in technology and markets. The four-quadrant model shows the dynamics of innovations according to their technology and market impacts. The author used the four-quadrant model of innovation to determine the position of Helseboka in the innovation framework.

In order to determine the innovative position of Helseboka, its necessary to understand the service that Helseboka offers. Helseboka shares health data and connects doctors and therapists with patients and caregivers as well as it make follow-up and treatment on schedule. As displayed in the competitor's analysis, there are no such digital platforms that offer such comprehensive set of digital solutions in one application. Thus, Helseboka is a radical innovation as it provides new technology in the healthcare sector in the form of digital communication, data sharing and data management application. In addition, it delivers specialized content also in the form of website. Moreover, it provides a comprehensive data management and integration solution that is not available in the existing healthcare system before. On the other hand, the existing healthcare system of Norway uses health journal for data sharing and recording. However, Helseboka provides fast data access and sharing

solution. The data file transferred within 1-2 minutes between patients and healthcare system. Although, basic digital communication by messaging is available already but Helseboka provides, advance communication and coordination solution with advance features that are not available before.

In the context of market that innovation will serve, it would be the radical disruptive in short run, as it will focus the private doctors in the health professional market that is a new market. Radical disruptive is a high risk, high reward position and in the form of reward, it will help to enter the main public market segment. On the other hand, for a long run prospective, it would offer as an additional function for the existing public healthcare market. It would not replace the journal system completely rather, it will offer the additional communication and sharing function to the existing market actors. Thus, it would be categorized here as a radical sustaining innovation that innovation position is characterized as high risk and defensive. The market strategy for the innovation is discussed in the next market study chapter for this thesis. However, the marketing focus for the innovation is to reach the main public segment thus the position of Helseboka in the four quadrants of innovation for the long run prospective is shown in the picture below.

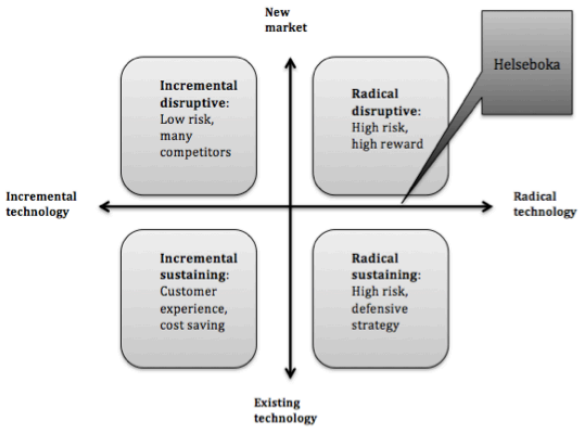



*Figure 13: Position of Helseboka in four quadrants of innovation Adopted from Christensen (1997)& carpenter (2009)*

### *2.8.2. Helseboka in the framework of Responsible research innovation*

According to Stahl et al. (2017), for innovation to be able to diffuse in a responsible way, its purpose, process and outcome with regard to ethical and responsible behavior should consider four elements suggested by Stilgoe, Owen and Macnaghten (2013): anticipation,

inclusiveness, reflectiveness and responsiveness. As a research based innovation Helseboka has applied all four dimensions of responsibility in its process.
However, Helseboka is a health care innovation whose main purpose is to improve the communication and coordination between health professionals and patients. The motivation behind the innovation is beyond self centered and individualistic goals and it is to play a role to provide a better health to people by improving communication and involvement in health care process. So the responsibility of the process of innovation is connected to their social purpose. As the inclusion is concerned, from the start of the idea and development process, the firm get itself actively involved with relevant stakeholders as patients, health professionals and health management personals to get their feedback and suggestions.

Moreover, from doctors, they got feedback before starting development and also during the process the discussion continued from time to time to ensure their involvement in order to represent their ideas, creativity and voices. Secondly, different patients interviewed to discuss complain and problems with the health care system and continued follow up on different issues with them. The initial idea was to develop an app for better communication and coordination at different stages in the health care system but by involvement of different stakeholders, there has been found other dimensions of the issue like data protection and patient empowerment.
Anticipation is systematic thinking about emerging critical issues and discovering new possibilities and opportunities (Martin 2010; Stilgoe Owen and Macnaghten, 2013).
For anticipation, the innovation process debated future outcomes and risks of different features and actively involved itself to find the weak points and improvement in these holes continuously. The procurement in the healthcare system is the biggest challenges that had been identified by inclusion with health professionals and management people. The innovator identified the weaknesses and developed app system with improved and advance security to provide better procurement solution. Moreover, The features of the app are developed and improved after careful analysis of the needs of patients and doctors. The process of inclusion and anticipation was overlapped somehow, which involved participation of different stakeholders at different levels before and during developments of app to develop some solutions and checking its usefulness and flaws and removing it by testing its practicability.
Reflexivity in the context of RI involves holding a mirror up to one's activities commitments and assumptions, being aware of the limits of knowledge and being mindful that a particular

framing of an issue may not be universally held (Stilgoe, Owen and Macnaghten, 2013, p. 1571). Here the app system was tested that if it comply with the Norwegian standard of validity, reliability and confidentiality and what are and should be the limits of the Helseboka. The features of the app are tested on the actual grounds with a group of patients, health and management personals and their feedback is considered to make some improvements such as the data storage function security and consent form developed after feedback and the design of the app is changed to fit all sizes after careful consideration of user's feedback. The login security function tested if it fits the needs and the high standard of security and how would it be applicable. Here, the firm paid close attention to value systems and social practices in the healthcare system that has been complied in the developed innovative Helseboka.

Finally the Responsiveness assures the relevant actors that their ideas, views, or voices are taken into consideration since it is about demonstrating a deliberative attitude (Meijboom, Visak and Brom, 2006). The care and respect is given to the stakeholder's suggestions, views and prospective during the whole innovation process from idea to outcome. The firm made the involvement of different stakeholders at different stages possible by dialogues, discussions and meetings with doctors and health professionals during the development and testing of the application and also the firm also designed features and functions by keeping in mind the needs of the users. The whole innovation process of Helseboka was flexible where all the demanded changes had been made after careful consideration of feedback from different actors at different stages of development.

### 2.9. Technological status and next steps

The app is already in production. It is much easier to use, on the move, and with an excellent communication flow between two or more people. Moreover, it provides Multimedia/video/ tele-conferencing and it will let patients to collect all data about themselves and then share as they want. The IntMed products will be sold primarily through app. The app is in the Norwegian and English language but it will be translated into other languages in future. The application uses high online banking security system and meets high level of security standards in Norway. The application will be developed further to be compatible with different countries' security systems used in that country to capture the international market. Almost every two weeks, new features are being added and modified or developed the

existing features in the application to match the customer needs that are identified through continuous customer feedback and involvement.

### 2.10. Conclusion

The innovation study chapter answers the sub-question “what is the innovation position of Helseboka and how it positively impact the healthcare system of Norway?” Helseboka is an innovative and novel solution. It’s a first advanced communication and follow-up solution for patients and health professionals that strengthen the influence of patients by connecting and fast sharing of digital data.

First the author has discussed the health care system of Norway, its existing problems and reasons behind these problems. As the problems with the existing health care system of Norway are high cost of manual processes, insufficient ability to facilitate customers, communication roadblocks, loss of follow-up, and insufficient patient engagement. Due to these problems, the patients play a passive role in the existing system. Helseboka can open up the opportunity to change this situation and it will make the patient involvement and coordination in the healthcare system possible by better communication and coordination. It increases the participation of all stakeholders of healthcare systems in decision-making and consequently provides high quality and less costly healthcare.

However, the main challenges faced in technology implementation being a radical innovation and the sensitive sector of health field are strict regulations, technology resistance, norms and values that affect the behavior of institutions and individuals for accepting an innovation. Helseboka system meet the high standards of privacy, security, confidentiality and rated high in the health applications evaluation framework that technically fits it in the healthcare system of Norway. Moreover, the cost-benefit analysis shows the cost-effectiveness and value proposition of innovation for different stakeholders and society.

In addition, the application of responsible innovation purpose and process ensured the participation of all stakeholders that helped the innovation to be molded exactly according to the needs and expectations of the interested stakeholders. In short, Helseboka passed the challenge of technological fitness and cost-effectiveness. Furthermore, it needs some technological and strategic improvements to enter into the international market that will be discussed in the next chapter of market study and further in business plan.

# Chapter 3

## 3. Market study

The aim of this chapter is to answer the sub question" who are the main stakeholders for Helseboka and how to reach them?" This chapter follows the framework of strategic market development by Aaker, D. A. & Mcloughlin, D. (2010). According to that, the marketing is now more and more accepted as being part of the strategic management of the organization. One marketing role is to be the primary driver of the strategic analysis. The market study is a best place for external analysis to understand the forces and trends related to customers, competitors, market and environment. The author starts the market study with customer analysis in order to identify and analyze the customers for Helseboka and explains another dimension of business strategy owned by marketing, the customer value proposition. Next step, competitor analysis presents the potential competitors for Helseboka and explained by using concept of blue ocean strategy and followed by market analysis that includes all the market research and market data.

Further in this chapter, the analysis of environment is presented by using the PESTEL (Political, Economic, Sociological, Technological, Legal, and Environmental) analysis model and strategic fit framework. Finally, finally the SWOT (strengths, weaknesses, opportunities and threats) analysis is used for internal analysis that also determines the direction for developing a suitable marketing strategy. At last, using the findings from internal and external analysis for the innovation develops a successful marketing strategy and process.

### 3.1. Customer analysis

Healthcare consumers are changing today and their expectations about convenience; cost and quality are redefining the healthcare system and patient's engagement with the healthcare system. It was estimated by WHO (World Health Organization) that 50% of individuals in remote areas of the world would have mobile phones as of 2012, and 500 million people would have access to mobile Health applications by 2015. Moreover, a study by Wangberg et al. (2009), estimated that in 2010, 84% of the Norwegian population used the Internet for health purposes that is increasing continuously till now. Although a large number of the population uses mobile phones, therefore Helseboka being a digital health solution could find its way into the market easily. As customers have a direct relationship with the

product/service, they are a rich source of opportunities, threats and uncertainties so, in strategic market planning, first logical step would be to analyze the customers.

The customers can be divided into three segments on the basis of different needs and motivations for these groups. (i) The patients that are the end users, (ii) health professionals are also users and (iii) management personals, the benefactors and main paying customers. The main goal of Helseboka is to reduce the communication gap between patients and health professionals and develop collaboration between these groups. Customer's understanding can be partitioned into customer segments, analyzing customer's motivations, identifying unmet needs and matching Helseboka features with the customer expectations.

Expectations for digital capabilities are on the rise from booking the appointment to communication and secure data sharing. The users are dissatisfied with many aspects of the existing healthcare system. According to survey conducted with patients/ caregivers, the long waiting hours, low involvement of patients in healthcare decisions and access to information are the main problems. There is a tremendous need for communication and involvement of patients in treatment and health care decisions that could be defined as need for patient empowerment. Similarly, time saving, access to information or data and efficient follow up of treatment for patients are unmet needs that required attention.

The results of survey conducted on patients' shows that timely access to healthcare and time flexibility is most valued considerations for them. Almost 90% place greater importance to fast access and convenience of appointment time, 85% gives importance to self-monitoring and better communication system. 65% appreciated fast secure data sharing and data storage platform. While 63%, shows interest and importance for follow up and treatment reminders. Surprisingly, cost of the service was the least important factor for most of the people as compared to convenience, efficiency, accuracy and security. Only 48% gives importance to cost of healthcare. The evolving preferences across the patient group matches with the features and solution designed by Helseboka specifically for patients. Moreover, in Norway, the patients or caregivers that are searching impatiently for such solutions are related to chronic disease, care needs such as disabled, rehabilitation needs and old people. Thus, this group of patients, rehabilitation centers, and caregivers for disabled persons would be the first users for Helseboka.

On the other hand, needs for health professionals are different such as they need a solution for workflow management, patient follow-up, and precise communication with patients, planning of work and fast coordination with other health professionals in the system. By summarizing,

the data collected by interviewing different health professionals, results shows the main motivations for health professionals are increased efficiency, “one patient, one record”, less crowded waiting rooms, released time for medical assessment, patient follow-up, precise and efficient communication and workflow management. Thus Specifically designed solution for doctors by Helseboka would meet all the “needs and motivation” demands of the health professionals. The other factors that drive the health care sector to adopt the innovation are consumer preferences. Changing patient preferences also changed the choice of care providers. Now patients are more likely to choose healthcare providers with digital capabilities. Thus providers must adapt and consider greater and efficient use of digital capabilities to meet the patient’s needs. To sum-up, besides public healthcare system, the initial possible customers from health professionals would be the private doctor clinics that would buy the application to meet growing patient demands and beat competition and for internal efficient management of work. The table below shows the relative segment needs, motivations and Helseboka features.

| Customer segments | Unmet needs | Motivations | Relative Helseboka features |
|---|---|---|---|
| Patients/ caregivers | • Access to information or data<br>• Follow up of treatment<br>• Self- empowerment<br>• Reporting of health system feedback<br>• Fast communication<br>• Time saving | • Time flexibility,<br>• Easy access to information and doctor<br>• Self-monitoring and better communication<br>• Active<br>• Data capture/ documentation<br>• Access to user friendly and secure digital services<br>• Increased participation in treatment decision making | • Digital dialogue with e-consultation, e- contact and large picture and audio attachments.<br>• Video consultation<br>• Online appointment Booking<br>• Mobile journal<br>• Reminder of appointments |
| Doctors/ health professionals | • Follow up of patients<br>• Adequate workflow management<br>• Insufficient patient engagement<br>• Replacement to Time consuming manual processing<br>• Fast provision of care<br>• Planning and coordination<br>• Fewer unnecessary consultation and reduce burden of care | • Increased efficiency,<br>• Time saving<br>• Patient follow up<br>• Work management<br>• Easy and secure access to patient information<br>• Reduced waiting lists<br>• Reduced provider’s liability<br>• Improved relationship with patients | • Integrated payment system<br>• One patient- one record<br>• Customization of solution<br>• Video consultation<br>• Mobile journal<br>• Unique time book and calendar<br>• In-check function<br>• Digital dialogue with patients or care professionals |
| Management personals | • Fast Coordination of information<br>• Planning and management<br>• Fast data sharing and communication between departments<br>• Reduced errors | • Reduced cost and<br>• Health care efficiency,<br>• Better planning and coordination<br>• Access to data for quality improvement, health monitoring and research<br>• Increased confidence in care and control | • Free installation<br>• IOS, android and web compatibility<br>• Coordinated Mobile journal<br>• E-consultation, digital consultation etc. |

*Table 6: customer analysis for Helseboka*

In comparison to above mentioned customer groups, the unmet needs for healthcare management are less Care coordination has been pointed out as a weakness in the healthcare system. There is a need to take incentives for communication and collaboration between different departments in health care systems at different levels. It needs to improve planning and management of the system. The author concluded main motivations for healthcare management, by interviewing them are reduced cost and health care efficiency solution that in turn leads to better planning and coordination in health care system. Increased efficiency is important for creating a good reputation in the healthcare system. In private hospitals, health professionals & management roles performed by same persons mostly. Thus, the buying decision would be easy but for public sector or the big hospitals the motivations for application adoption are different for users and benefactors. Thus, collaboration between these two groups and their preferences needed to trigger the purchase.

### 3.2. Competitor analysis

The competitor's analysis in this chapter can be viewed in two ways: Direct competitors and indirect competitors on the basis of single and collective features provided by them. When customers search solutions for patient-doctor communication, data sharing and data management, there are a large number of such systems worldwide that provide these solutions separately but very few or none such solutions are available that provide a comprehensive whole package in one application. However, main competitors would be the applications that provide solution for patient-doctor communication, data sharing, storage and management, all features together or at least some of them in one application. Some popular solutions that are related to that search are MD click, Genie MD etc. solutions available globally. Helsenorge and Helseresponse are popular applications available in Norway. These global healthcare solutions provide communication and data sharing function but do not facilitate data management, patient follow-up and in-check functions. Thus, Helseboka has competitive advantage over these solutions because it provides extra functions along with the functions available in these applications in addition and also advanced version of existing features. Since, Helseboka focuses on the Norwegian market and main competitors in this market are Helsenorge as well as Helserespons. However, Helsenorge could be a potential partner/customer for this radical innovation and Helseboka can work as an addition to existing journal system with new and advanced features that can help to improve the efficiency of Helsenorge. Helseboka can improve the efficiency and feasibility of the system by providing

the advanced communication facility as picture and video sharing, video conferencing, can provide fast data access and sharing between different stakeholders and patients and can help to keep track of the patient's health by managing and coordinating the treatment sessions, especially for the chronic disease patients that needs regular checkups, this innovation can provide "one patient-one record" solution with improved features and feasibility of use and help to improve management of healthcare by information and data management solution.

In comparison to Helseboka, there is alack of important functions in these competing applications such as Helsenorge do not provide video calling and conferencing solution. Similarly treatment reminder, in check and data management solutions for doctors such as integrated payment is not provided by these applications. On the other hand, Helseresponse provides only communication solution but does not give facility of fast data access, sharing and data management. The comparison of Helseboka with possible direct competitors is shown in the table below.

| Application name | Focus | Advance communication solution | Fast, Secure and integrated data access, sharing & storage solution | Patient and treatment follow-up solution | E-diagnosis | data management solution | Pricing structure | Competitive advantage |
|---|---|---|---|---|---|---|---|---|
| **Helseboka** | Mobile solution for communication, data sharing, data storage, appointment booking and record keeping | ✓ | ✓ | ✓ | ✓ | ✓ | Free installation + package purchases | First Mobile solution in Norway that provide all required healthcare features in one platform |
| **Helseresponse** | Online solution for patient dialogue, digital mail and online timetable | ✓ | ✗ | ✓ | ✗ | ✗ | License + Model package purchases | Used by 1100 medical offices today |
| **Helsenorge** | An online platform for appointment booking, e prescription, e-consultation, sharing and storing data | ✗ | ✓ | ✗ | ✗ | ✓ | Free installation and public funded | A platform in use of public health system |
| **Genie MD** | Care team feature to securely communicate, maintain and share personal health records for both patients and health professionals | ✓ | ✓ | ✗ | ✗ | ✗ | Free service, Payment of physician bills online + no extra charges | Special section dedicated to patient education |
| **MD click** | Shares reports with patients, notify appointments and video consultations. Tool for data sharing and care integration between care professionals | ✓ | ✓ | ✗ | ✓ | ✗ | Price per appointment/ consultation | HIPAA compliant health information technology and available in 88 languages |

*Table 7: Comparing Helseboka with potential global and Norwegian competitors*

In short, Helseboka is the first mobile application in Norway that provides all required communication, data sharing storage and management solutions at one place.

The second is strategic competitor groups that can be characterized as indirect competitors. When we search the patient centric applications, there are many applications that offer single facilities such as function of communication or data storage or health tracking, but it's rare to find all the qualities in one system. However, there are some strategic groupings of system applications that provide some similar single facilities on the basis of problem solving that could be considered as indirect competitors.
First direction of problem solving is communication between patients and healthcare professionals. In health care timely communication between doctor and patient enables former to keep track of medical condition and intervene when necessary while for the later provide timely and accessible medical advice. There are some global applications that are developed for communication between health professionals and patients. For example, siren MD, well text, and Athena well, that allows sending messages, videos, photos and online calls between health professionals and patients. Similarly, There are some in-direct competitors in Norwegian market that provide communication solution such as Kry, Eyr and Confrere.

The second direction of the problem solving is patient data access and sharing. Patient data access and sharing has to be secure to ensure patient confidentiality. Apps in this area facilitate the view, storage and sharing of patient data that provide the facility for healthcare professional for data sharing and for the patient to get access to their health data to be involved and participate in the healthcare decisions. For example, PHT system, MIM cloud and Genie MD, that allows doctors and patients to view, share and record patient health data. In Norway E-boks and Digi post is used for medical record access and sharing between patients and health professionals. The table below shows data access sharing and storage applications.

Third category is the patient compliance with the treatment is the key to success for health and treatment regimes. So the medication and treatment reminders are one of the options to keep the patient’s treatment on track (kebede, et al. 2015). One of such examples are Medisafe Meds & Pill Reminder (Medisafe 2016). Such apps are particularly useful for

patients with chronic diseases and intensive care needs that need multiple and regular treatment regimes. The table below shows the details of applications with these functions The indirect competitors and detail of their facilities is provided in the table below.

| **Apps for doctor-patient communication** | | | | | |
|---|---|---|---|---|---|
| **Application name** | **OS compatibility** | **Focus** | **Communication** | **Follow-up** | **Data access, storage and sharing** |
| Well texts | IOS & android | A structured communication system that connect patients to healthcare via text, phone, email, and live chat | Yes | No | No |
| Siren MD | IOS & android | Health updates in real time, diagnosis, request of images and communication in text form that helps deliver collaborative care to patients | Yes | No | No |
| Athena well | IOS & Android | A secure messaging function to communicate with health team and also keep track of the actionable tasks by notifications and report to care provider | Yes | Yes | No |
| KRY | IOS & Android | A solution to book a video appointment at convenient time and place | Yes | No | No |
| EYR | IOS & Android | See the doctor online and appointment booking | Yes | No | No |
| Confrere | IOS & Android | Confrere offers a video-calling tool that is safe, secure, and easy to use for both doctors and patients. | Yes | No | No |
| **Apps for data access, storage and sharing** | | | | | |
| MIM cloud | IOS | A secure, internet-based medical image service that provides an easily accessible resource for storing, sharing, and viewing your data. | No | No | Yes |
| PHT system | Android | In Patient history tracker The patient can get access by unique ID and password to view reports and prescription | No | No | Yes |
| Genie MD | IOS & android | Care team feature to securely communicate, maintain and share personal health records for both patients and health professionals | Yes | No | Yes |
| Digi-boks | IOS & android | You receive mail from more and more private and public senders in Digipost. It is safe, easy and accessible. | No | No | Yes |
| E-boks | Ios &Android | With e-Boks, you can access your mail anytime and anywhere. E signature allows sign and send the documents | No | No | Yes |
| **Apps for patient's appointment and treatment track** | | | | | |
| Medisafe meds | Android | Book appointments, add medications, reminder for taking pills and receive constant tracking of patient's health progress | No | Yes | No |
| Medica reminders | IOS | Add medications, reminders for medication and receive constant tracking of patient's health progress | No | Yes | No |

*Table 8: Indirect competitors (applications with single features)*

Although the applications listed in the above table are considered as indirect competitors. Since Helseboka is only one and radical innovation that focuses on all the three problem solving features communication, data storage and sharing and keep track of treatment in one application.

### *3.2.1. Applying the concept of Blue ocean strategy*

To better understand the position of Helseboka in the Norwegian market in comparison with the possible direct competitors, blue ocean concept is utilized. The strategic framework is, according to Kim and Mauborgne (2005), a diagnostic and action structure for setting up strong blue ocean strategies. Along its horizontal axis, the framework deploys a range of factors by which industries compete and invest and on vertical axis the level of supply available to customers over range determining factors.

In blue ocean concept, Value is conceived as (i) the main attribute of a product/service; (ii) the psychosocial attributes of customers, thus, the ways they interpret the main attribute and (iii) the economic attribute (Yang & Yang, 2011). The perceived value was measured by the application of a questionnaire that seek the expectations and perceptions of customers based on functional, psychological and economic attributes provided by Helseboka. The final results portray the value curve that is a graphical representation of the performance of each innovation as regards to its competitive factors (Kim and Mauborgne, 2005; Sheehan & Bruni-Bossieo, 2015). Moreover, the primary focus of Helseboka is the Norwegian market, thus these attributes are compared with the Norwegian industry healthcare applications. Main competitors in the Norwegian market that are Helsenorge that is serving the public sector now and Helsenorge that have market other than public sector.

The results from 70 survey respondents and 5 interviews shows that the most important functional attributes are: communication via messaging, picture or video sharing, appointment booking, video conferencing, online access to medical data, E-diagnosis and useful management functions for doctors such as payment integration, one patient – one record. However, there are some attributes with lesser level of importance for users, such as reminder or alert functions, shock response, customization etc. the comparison of the value curve for the functional attributes of the innovation Helseboka with the Norwegian healthcare industry is shown in the chart below. However, it is clear in the picture that Helseboka has received high valuation from customers in the technological factors as compared to the competitors. It shows Blue Ocean for the features of fast data access and sharing, data management solution and for advance communication features. These mentioned features are either new in industry or these are improved than already existing market features thus provide a ground for creating new market or new demand.

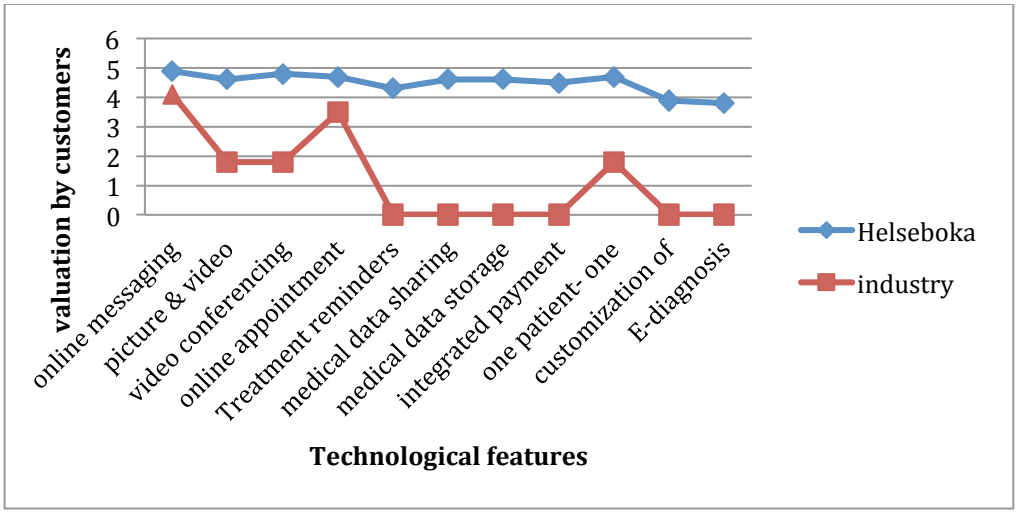



Figure 14*: Value curve for functional attributes*

Moreover, there are psychological attributes of Helseboka that has been awarded high level of importance from respondents: such as accuracy of data, security, and validity, speed of data access and sharing and ease of use of the application. However, health care is a sensitive field, customers prefer high quality even if it comes with high cost, which is provided by Helseboka but at low cost also. The value curve with psychological attributes for Helseboka and Norwegian industry is shown in the figure below. Moreover, value curve of Helseboka lies at the highest point on the valuation scale for the psychological attributes of the application that is security, privacy and ease of use. This competitive advantage will make possible to create new demand and new market for Helseboka.

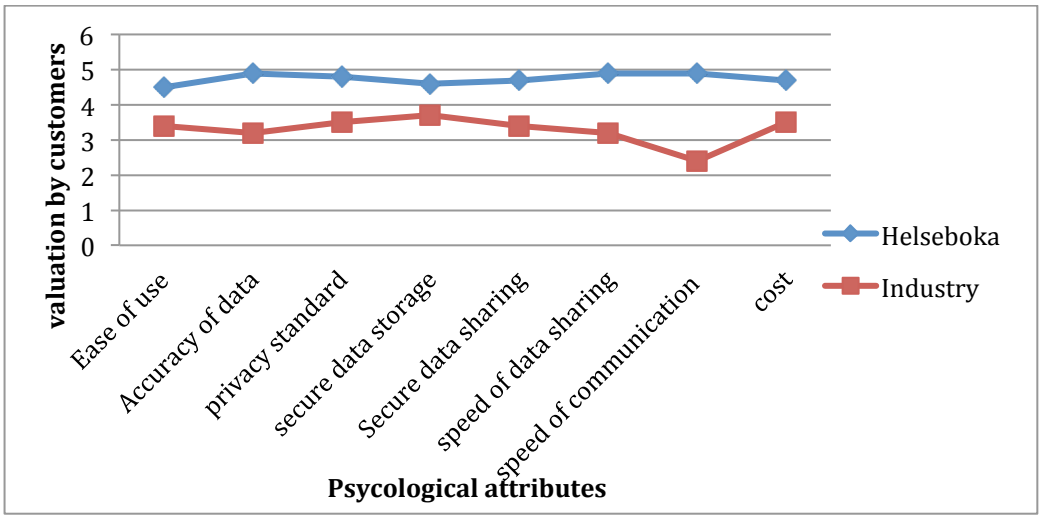



Figure 15*: Value curve for psychological factors*

However, economic attributes are not just direct costs buying cost, monthly package payments but also include indirect cost elements such as installation costs, maintenance costs and cost for training of people for using the new system etc. the economic attributes that customer value most are initial buying cost and monthly package payments. Helseboka provides low initial costs and monthly costs and also choice of economic packages according to feasibility that makes it unique in comparison to its competitors. However, other indirect costs are also important for customers like installation cost or training costs, which are low for the presented application. The economic benefits that Helseboka provide, are higher as it provides the overall cost reduction in comparison to competitors that lies in the medium or low level on the valuation scale. Thus it can be seen from the comparison that Helseboka has clear advantage over competitors that will create Blue Ocean for Helseboka.

The comparison of economic features for Helseboka and industry can be seen in the figure below.

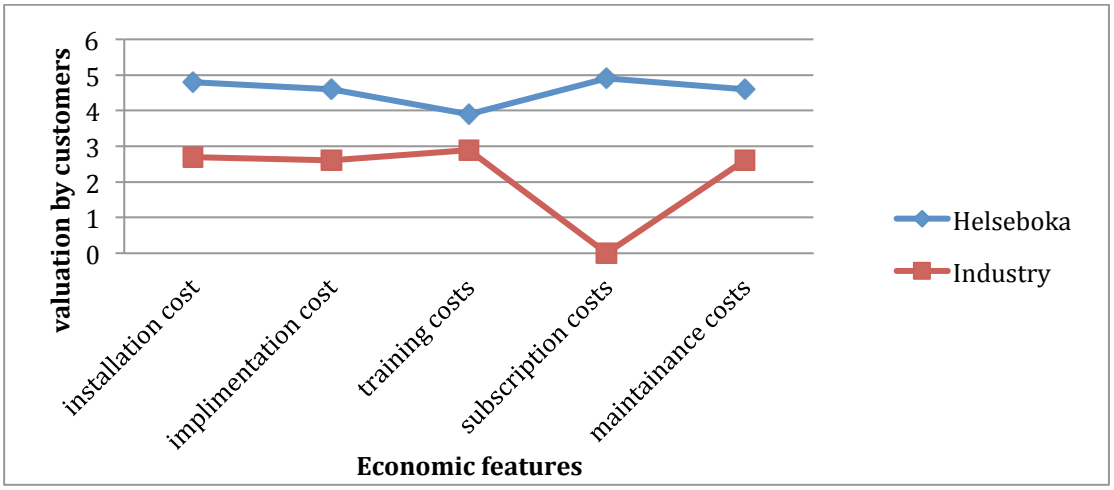



Figure 16*: Value curve for economic factors*

The blue ocean concept for Helseboka is presented in the table below. There are new key features provided by the application that are not available in any application before such as customization, E-diagnosis and integrated payment system. Application provides improved security and accuracy features above the standards and also provides some improved factors to increase the main management and coordination.

Moreover, application removes some negative factors as training and maintenance cots and provides a user-friendly model. In addition, it reduces the impact of key factors such as application compatibility that reduces the implementation cost for the application/ system.

| New features not available before | Increased key features above standards |
|---|---|
| • Mobile healthcare application with all the required features available at one place<br>• New communication and data sharing and management functions, not available before. | • High security level of data storage<br>• Consent form for data sharing provide high security and accuracy level<br>• Modify systematic factors that increase team based care and unburden healthcare |
| **Eliminate negative factors** | **Reduce some negative impact of key factors** |
| • User-friendly application that eliminates training cost<br>• No maintenance cost for users | • Reduced costs<br>• Low implementation costs due to application compatibility with existing system |

*Table 9: Blue ocean concept for Helseboka*

In short, Helseboka provides all required healthcare functions at one place that are most valued by the customers. In comparison with the Norwegian healthcare industry mentioned in the section above, Helseboka is the only one application that provide all the highly desired and valued functional, psychological and economic attributes of the solution for customers that enables it to create a new value and new demand from customers by providing a unique, comprehensive and cost- effective solution.

### 3.3. Market analysis

As defined in the customer analysis in this chapter, the focused market for Helseboka is Norway. There is huge market in Norway because a large population uses digital solutions for normal life activities and healthcare as well. According to numbers provided by Difi Norge, 13,859,228 people use ID portal online and 2185547 used digital mailbox in December 2019. Norway falls in the category of "running ahead" in the DESI index. EU's Digital Economy and Society Index (DESI) is an index that measures European countries digital development level. The index consists of indicators along five dimensions that are connectivity, human capital, use of internet services, integration of digital technology and digital public services. Based on the results of these indicators, Norway lies in the group of countries with highest DESI score. Norway is a digitally advanced country where people are digitally aware and use technological solutions in daily life and healthcare. Thus, it would be an advantage for Helseboka because it is providing a digital healthcare solution therefore, it would be easy to enter and penetrate the Norwegian market. DESI index figures of Norway in comparison to 28 countries and EU for 2016 are shown in the figure below.

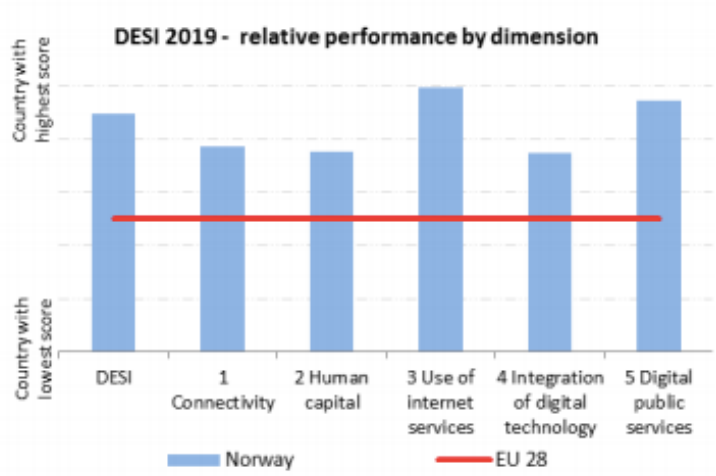



Figure 17: *Digital Economy and Society Index Norway 2019, Source:( European Commission, 2016)*

On the other hand, a large proportion of patients in Norway with chronic diseases and disability, need a solution to cope with lifelong conditions. They have highest probability of becoming users of Helseboka because, a significant proportion of those who are affected by these diseases needed health and care services that give a rapid diagnosis, advice and help in improving lifestyle, active treatment, communication, good rehabilitation and continuous follow-up. In addition, chronic diseases also called as NCD (non communicable disease) are estimated to account 87% of all deaths. Norway's overall goal is to reduce premature death from chronic diseases, such as cardiovascular disease, diabetes, chronic lung disease and cancer by 25 per cent by 2025. Thus the market in these areas is looking for an innovative solution. Thus, Helseboka can find a place in the market as it fulfills the needs of current situation. In order to define the size of the user's market, it is crucial to be aware of the number of chronic disease patients and disabled patients in Norway.

However, the statistics showing the population of people with chronic diseases usually display the Disability Adjusted Life Years (DALYs) instead of the number of the population. DALYs is defined as "the sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability" (WHO, 2005). The numbers displayed are DALYs of the disease group according to age group in 2016, are shown in the figure below. Different colors show different disease groups according to age- groups on the horizontal axis and number of patients on vertical axis.

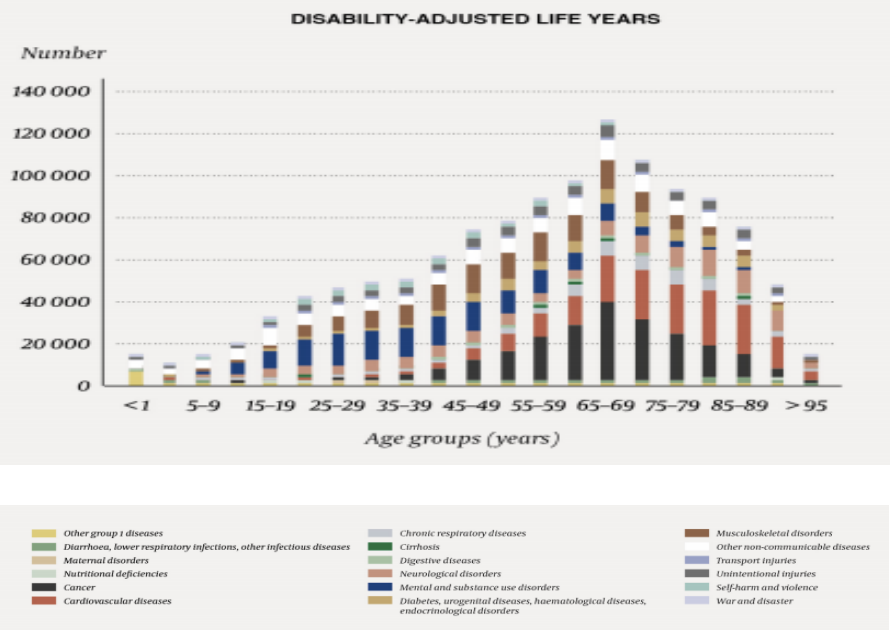



Figure 18*: The burden of disease in Norway. Source: GBD2016 – healthdata.org.*

It can be seen in the figure above that chronic disease patients cover a large proportion of population in each age group. Customers with chronic, complex disease and mental illness live with one or more chronic conditions affecting one or multiple body parts. They require uncomplicated (one body part) or complicated (more body parts) disease management. According to figure provided by Stat bank Norway for 2019, annually, 70,000 patients treated with cardiovascular disease, 6% of population under 75 years takes anti-depressants. There are 80,000-100,000 patients with Dementia and 32000 new cases of cancer are diagnosed in 2019. These different group of chronic disease patients shows huge proportion of people needed a solution for regular follow-up, to communicate and coordinate with health professionals that is potential customer group for Helseboka.

Moreover, In 2017, the disabled proportion of the population, according to the Labor Force Survey, was 17 % of the population between the ages 16- 66 is disabled, which equals approximately 605 000 people. Nevertheless, this number does not cover the disabled population under the age of 16 and above 66. The trend of using digital technology in healthcare in Norway is increasing. Thus, potential users from these group can be expected approximately 600,000. However, there is much important aspect is providing a solution to improve the lives of these people. The figure below shows the proportion of population, 16-66 years with disabilities in Norway for 2017.

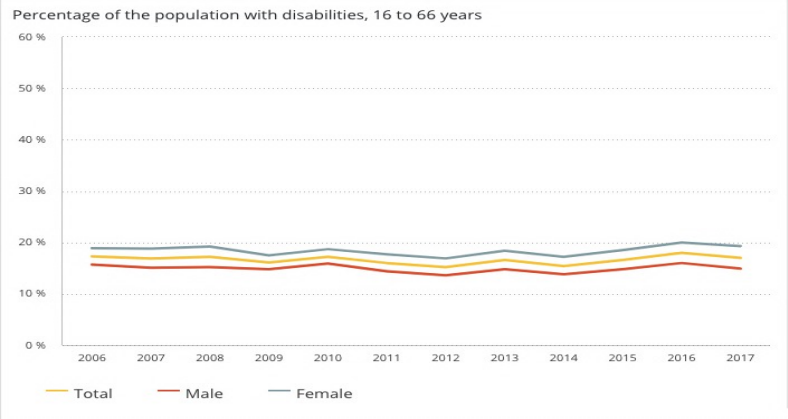



Figure 19: *Proportion of population with disabilities in Norway, according to Labor force survey (source: bufdir.no (2017).*

Another important customer segment is the healthcare professionals that need a solution for patient and workflow management, solution for communication, coordination with patients and other health professionals and for patient follow up. According to European forum of primary care, there are 22,500 doctors in Norway and around 4500 works as GPs. Among these, 54% are specialists in general practice, and 90% work in group practices. However, Primary potential customers in this group are private doctors, physicians, and dentists in Norway. This group of customers is defined as users. There was an average of 1,127 patients per GP in 2015. The figure below shows the number of private practitioners that is approximately 10,000.

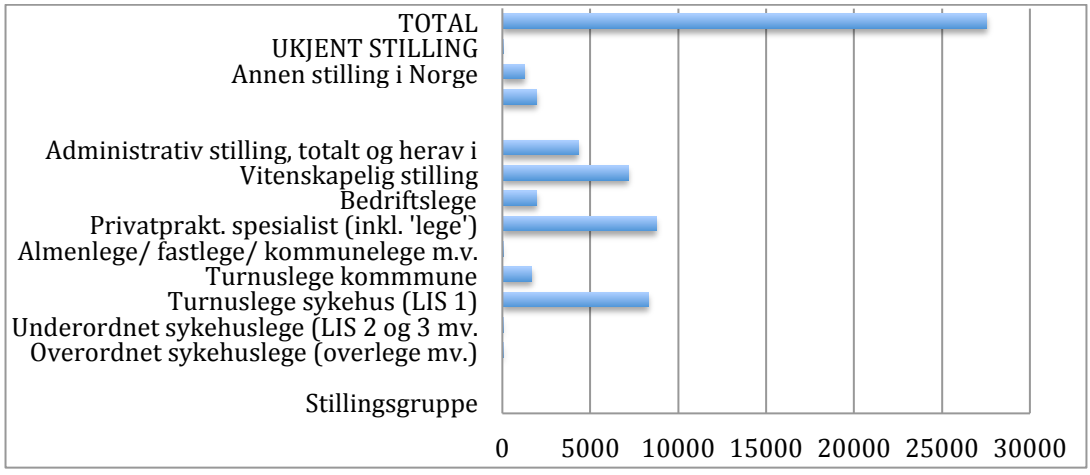



Figure 20*: Yrkesaktive leger < 70 år i Norge fordelt på stilling per 19.3. 2018*

Moreover, according to WCPT (world confederation for physical therapy), total number of physical therapists in Norway is 13,104, 56% are members of Norwegian physiotherapist association that are 7,321. Physiotherapy in Norway is mainly a service provided by private

practitioners to patients 17-69 years of age. Thus this is a potential group of customers that can be accessed easily. Another, potential group are healthcare centers in Norway that could be potential users. There are 430 municipalities in Norway that serve health care services in their areas. Services include general practice, pregnancy, health clinics, mental healthcare nursing homes, physiotherapists, communicable disease control and other. Statistics Norway shows, 31.2% residents 80 years and above used home care services in 2018. Thus, this is a potential customer segment would be another focused group that would also help to enter into the public sector as municipalities are semi government institutes. Overall, there is a huge potential patient and health professional's market in Norway. Moreover, there is a need to analyze the environment to identify possible threat and opportunities that is done by using different theoretical frameworks in the environmental analysis section.

### *3.3.1. The environmental analysis*

There is a larger macro environment of forces that shape opportunities and threats for diffusion of Helseboka in Norway. Therefore, environmental analysis is crucial preliminary step to define opportunities and threats for Helseboka thus facilitating the next analysis, the SWOT (strengths, weaknesses, opportunities and threats) analysis. In order to analyze the environment, the PESTLE (Political, Economic, Sociological, Technological, Legal, and Environmental) analysis is used in this study.

***Political aspect***

The first aspect of PESTLE analysis is political that considers the affect of current and proposed laws/ strategies regarding healthcare system in Norway. Norway has recently launched eHealth strategies, which all support the agenda for connected and smart digital health and will boost digital healthcare collaboration across sectors. The Norway's digitization strategy for 2017-2020 sets three overall goals: i) Healthcare professionals must have easy and secure access to patient information. ii) Citizens must have easy and safe access to healthcare services. iii) Data must be available for quality improvement, health monitoring, management, and research. Overall, the strategy aims to establish more coherent patient journeys working towards implementing the concept "one citizen one health record". It is an opportunity for Helseboka due to alignment between Norwegian healthcare strategies and services provided by this innovation. On the other hand, healthcare system has high procurement standards; there are significant barriers of regulations, privacy, and security that could be a threat for Helseboka because its necessary to comply with these complex rules and laws. The changes in these laws or standards in future could also be a threat for innovation.

***Economic aspect***

The second aspect is the economic analysis of the healthcare system of Norway that is under tremendous pressure. Improved care quality has extended life expectancy but longer life expectancy and prevalence of chronic conditions that are mostly attached to older ages are driving an increase in the cost of healthcare. According to stat bank Norway's figures, health spending's been 10,4% of GDP in 2017 and increased by 2% in 2018. This is threatening the financial sustainability of the traditional healthcare delivery in Norway. Digital health initiatives are emerging as solutions to cost concerns. Norway is at the forefront to meet these challenges and has taken initiatives to seize the new technology to address these challenges. It justifies the choice of stronghold digital health strategies and smart digital solutions. Helseboka being a cost-effective smart digital solution has the opportunity to make its place in the market. Secondly, patient engagement has become a key strategy to promote informed decision-making and behaviors to improve health outcomes. For this purpose, the integration of stakeholders and development of healthcare data and governance system is needed. The data should be accurate, timely and understandable for every stakeholder in order to reduce medical errors and drive down the health delivery cost. It could be an opportunity for Helseboka as it fulfills the requirements of integration; healthcare system development and quality of data thus will help to drive down the cost.

***Socio-cultural environment aspect***

Next social aspects in PESTEL analysis means socio-cultural environment such as demographic and cultural factors of the market. In Norway, a large proportion of population has access to Internet and large proportion used Internet on daily basis and it is continuing to grow. The increasing trend of using Internet can be considered favorable for Helseboka diffusion in Norway. Second, Norway has growing population of elderly people and chronic disease patients. In order to provide efficient and holistic care to these chronic disease patients to stay healthy at their home, there is a need of digital healthcare solution like Helseboka. it could be an opportunity but elder people hesitate to use digital solutions, if that would be the case that could be a threat. The threat could be minimized by making the application more user-friendly.

***Technological environment***

Another aspect of analysis is technological environment. It is not just about technology, implimentation of technology also need organizational change. Norway has an increased focus not only on technological development but also on organizational development to adopt

these technologies successfully that offers a perfect opportunity for a radical innovation in the field of communication, information utilization and collaboration of different stakeholders in healthcare system. Thus, it is an opportunity for Helseboka to have a fovorable technological environment available that is already compatible with the system. Thus, for implimentation of the system does not need changes in the existing system or the innovation. Overall, Norway provides a suppotive technological environment for research and innovation in healthcare sector.

***Environmental aspect***

Environmental aspect has no significant impact on Helseboka as it is a digital innovation and has no physical production facility.

***Legal aspect***

Lastly, legal aspect of environment of the innovation. Although innovative solutions are protected by intellectual property rights (IPR). But there are so many features that are added on weeky basis, there is possibility of infringement or copying in some areas. That could be considered as a threat for Helseboka. This threat could be avoided by taking IPR for new added features. The table below shows PESTLE analysis for Helseboka.

| Elements | Factors | Impact on Helseboka |
|---|---|---|
| **Political** | • Norway's digitalization of healthcare strategy.<br>• Complex procurement issues. | • An opportunity for Helseboka due to alignment with Norwegian healthcare strategies.<br>• Threat in failing to comply with procurement standards |
| **Economic** | • Digital health as emerging initiative for cost reduction in healthcare. | • An opportunity for Helseboka as it provide cost- effective digital solution |
| **Sociological** | • Increasing trend of using Internet for healthcare.<br>• Current needs to facilitate patients with dementia, chronic diseases, diabetes etc. | • Opportunity as easy acceptability of Helseboka by users.<br>• Opportunity for Helseboka because it meets the needs of following potential group of customers. |
| **Technological** | • Digital transformation of healthcare system of Norway.<br>• Existence of focused technological and organizational development strategies. | • Opportunity as availability of compatible technological and organizational infrastructure. |
| **Environmental** | • No physical production | • No significant impact |
| **Legal** | • IPR of innovative solutions | • Threat as there is always possibility of infringement. |

*Table 10: PESTEL analysis of Helseboka in Norway*

### *3.3.2. Positioning of innovation in Strategic fit framework*

Besides PESTEL analysis, framework of strategic fit proposed by Ansari, et al. (2010) is used in this study to supplement environmental analysis. The framework consists of three elements for analyzing strategic fit: technical, cultural and political. By using the data from PESTEL analysis, the extent of strategic fit or misfit can be analyzed for Helseboka. Thus the extent of adaptation of practices can be identified based on technical, cultural and political grounds for diffusion of Helseboka in Norway. In the end, this framework would be able to reveal whether for diffusion of Helseboka in Norway needs to modify its practices or it can be fully adopted.

First, most important element of framework is technical fit. The characteristics of Helseboka considered to be fit with the existing technological platform in Norway. This is due to the availability of developed technical and organizational infrastructure as high speed Internet and focused strategies. Second, the involvement of all stakeholders in the innovation process provides maximum information about the innovation and reduces uncertainty. Thus, diffusion of Helseboka practices high fidelity and high extensiveness direction of technological adaptation. In conclusion, Helseboka fits the technical practices and its position in technical fit can be characterized as a full and true adaptation. The position of Helseboka in technical fit is shown in the figure below.

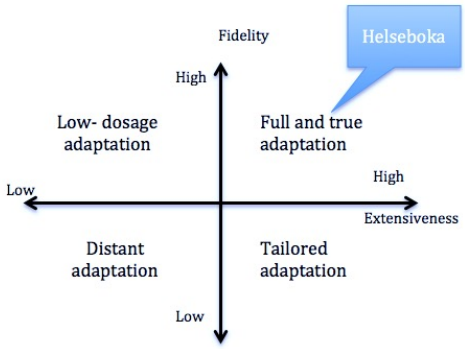



*Figure 21: Technical fit of Helseboka diffusion in Norway*

Second direction of strategic framework is cultural fit, in which Helseboka fits with the cultural attributes of potential adopters in Norway. Since it shares same values and beliefs such as improving the lives of chronic and rare disease patients that are discussed already through active engagement of users. Secondly, direct engagement with different stakeholders during innovation process gave the opportunity to influence existing cultural norms and values. Thus, it practices high fidelity and high extensiveness. Therefore, Helseboka practices

full and true adaptation of cultural fit framework. The position of Helseboka in cultural fit is shown in the figure below.

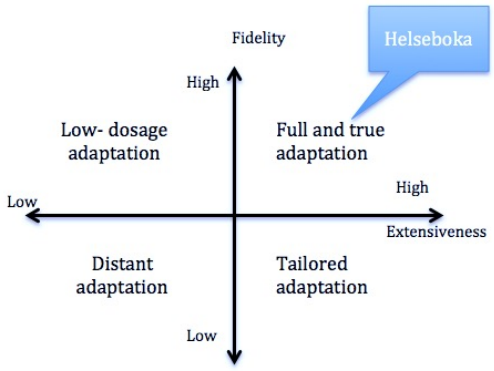



*Figure 22: cultural fit of Helseboka diffusion in Norway*

The last element of strategic fit is political fit that characterizes the extent of compatibility of Helseboka with the political interests and agendas of Norway in healthcare system. It fits with the political adopter's practices such as the characteristics of Helseboka matches with recent Norwegian healthcare strategies, interests and agendas and it meets the procurement standards. This is because the application is developed by the engagement of different stakeholders including civil society organizations and policy makers that helped to mold the innovation according to rules and regulation. However, due to complex procurement rules and standards structure, it's unsure to maintain its position with changing rules and standards. Nevertheless, healthcare is a sensitive field and it has complex security, accuracy and confidentiality standards. Thus, Helseboka can be positioned at tailored adaptation as it can be considered as adapted with low fidelity but with high extensiveness. The position of Helseboka in strategic fit in shown in the figure below.

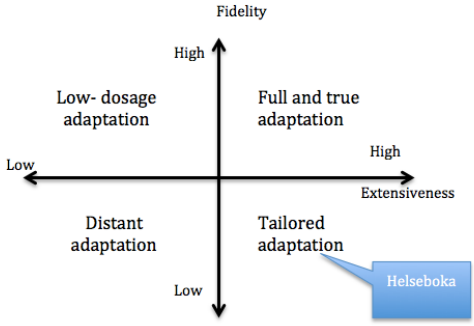



*Figure 23: political fit of Helseboka diffusion in Norway*

### *3.3.3 The SWOT Analysis*

The analysis of macro-environment has lead to the analysis of internal environment that can affect the future of Helseboka in market. For this purpose, the strengths and weaknesses of the service / company must be explored together with its opportunities and threats. The SWOT analysis is used for this purpose. The intention of SWOT, or strength, weakness, opportunity, and threat analysis, is to identify those internal strengths and external opportunities that an organization can leverage to accomplish its objectives, while also seeking to mitigate internal weaknesses and external threats (Lewis & Littler, 1997). This analysis will provide necessary data for developing a marketing strategy in the next section. The table below shows the SWOT components of Helseboka.

***Strengths and weaknesses***

In the strength section following advantages of Helseboka have been identifies. First of all, Helseboka is the first mobile health technology that provides a whole package of solutions needed in healthcare at one place. It is the major strength and competitive advantage as described in innovation study section of the paper. Moreover, the leaders of the project are well known physicians with healthcare experience and have expertise and knowledge about the needs and requirements of the healthcare system actors. Thus, their personal experience, knowledge and network are one of the internal strengths of Helseboka.

Another strength for Helseboka is financial support and cooperation of innovation Norway that is part of project and provides support in different areas. Connection with governmental organization gives competitive advantage and potential for further development and reduces uncertainty related to investments. Second, the partnership with "Huubro" is an advantage because it provides an existing market to present their new solution.

Moreover, Helseboka is a cost-effective innovation that is explained in innovation study part. The main strength of Helseboka is that healthcare sector in Norway is already looking for such solutions that can reduce the financial burden of healthcare system. However, locating in the initial home market gives chance to interact easily with the prospective customers whose needs they suppose to satisfy and can check constantly with them. The table with summarized SWOT analysis is presented below.

| Strengths | Weaknesses |
|---|---|
| **Technology**: First mobile healthcare technology in Norway. A unique solution that provides variety of solutions at one place<br><br>**Team expertise**: the team members are experts in health field and have direct contact with in healthcare sector.<br><br>**Relationships:**<br>i) Support from a reliable source that is innovation Norway in R&D is an opportunity to continue and expand its research and development activities.<br>ii) Strong partner Huubro has huge market share in existing market.<br><br>**Economic:** A cost- effective solution in healthcare.<br><br>**Location:** locating in the home market. | **Usage***:* digital divide may provide inequality in usability.<br><br>**Limited service history**: Difficulty to enter the system, due to no service history and deficiency of relations.<br><br>**Complex Marketing strategy:** difficult to differentiate due to varied specifications |
| **Opportunities** | **Threats** |
| **Political**: Alignment with current governmental healthcare strategies.<br><br>**Cultural:** Increasing trend for using digital solution for healthcare.<br><br>**Demographic:** chronic disease patients needed such solution. Increasing patients pushes pressure on doctors for record and data management.<br><br>**Technology**: compatible technological and organizational infrastructure of healthcare system | **Political:** Complex procurement standards in healthcare sector. Change of rules or government policies in future<br><br>**IPR issues:** Possibly of infringement in legal areas due to complex services. |

*Table 11: SWOT analysis for Helseboka*

However, there are relative weaknesses as well. Helseboka is a new and small company thus it has limited service history and deficiency of relations as compared to big companies that are already part of the system somehow. It makes difficult for Helseboka to enter into the public sector, although it has capabilities. Second, as it provides a variety of solutions at one platform and could be customized according to needs but still it is difficult to introduce specifically and have complex marketing strategy.

Moreover, digital divide may produce inequality in access and usability. The advance usage functions of application are little complex because they are designed to meet high procurement levels. The information in health care is very sensitive so it is necessary to meet the standards of confidentiality, security, validity and accuracy. Thus, to comply with these

standards made it little complex. On the other hand, a large number of patients requiring home care services or disease management interventions are elderly or in some cases have functional limitations. The usage of complex applications becomes challenge with inexperienced technology users and with possible functional limitations. That could be considered as a weakness. Considering several design considerations for elderly and population with functional limitations can minimize the problem.

***Opportunities and threats***

Another SWOT part is analysis of external factors such as opportunities and threats. The main opportunity for Helseboka is the current governmental healthcare digitalization strategies. Thus being a digital healthcare innovation, this is a golden chance for Helseboka to enter the market. Second, the increasing trend towards usage of digital solutions for health is also an opportunity for Helseboka. It will help to introduce the solutions easily to users.

Another opportunity is increasing number of chronic disease, diabetes, cancer etc. patients that need regular follow-up. Moreover, increasing patient data pushes the health professionals to adopt a solution for information and data management. Thus, it is an opportunity to capture a large proportion of healthcare customers, patients and health professionals.

The technological and organizational structure of healthcare sector of Norway is transformed to accept the new digital healthcare solution that is a big opportunity for Helseboka. Thus, it makes Helseboka easily compatible with the existing system and not much further transformation needed. Conversely, complex procurement standards and rules is a main threat for Helseboka. These complex standards also changed with time. To enter and stay in the market needs to comply with these rules and laws now and also in future. Another, threat is from IPR. Although many features and services are protected by IPR but being a digital innovation, there is always a chance of infringement. Implementing a sustainable business model and marketing strategy can minimize these threats and that will be discussed further in this chapter and in next chapter.

## 3.4. Marketing strategy:

### 3.4.1 Objectives

The main objective of marketing strategy for Helseboka is to capture the public healthcare sector in Norway because it is the biggest part of the healthcare in Norway. However, due to being a small company with limited service history, it is difficult to reach directly to this

broad segment. Thus, we have to set short goals first to reach the target and carve the path to the mainstream market.

It is identified, through internal and external analysis, that there is a big opportunity for Helseboka in Norwegian healthcare market related to chronic healthcare patients. Growing number of chronic disease patients that need regular follow-up and disease management continuously is a big challenge for the society that created a big opportunity for Helseboka. Moreover, the increasing number of patients, created the need for health professionals, for a data and record management solution. Thus, the primary objectives of marketing strategy would be acquiring the group of patients and the private health professionals/doctors. We have set aggressive but achievable goals for the first year and second year of market entry.

**First year Goals**

We are aiming for acquiring almost 200-300 potential private doctors and almost 20,000-50,000 patients in the first year.

**Second year Goals**

The goals are to capture total 400-600 doctors and almost 200,000 potential patients. However, in order to achieve the goals, we need to focus on two customer groups. Therefore, the marketing strategy is formulated to achieve two different but interrelated objectives: to get more patients and to get more doctors.

In order to reach these goals, marketing strategy is based on positioning of product differentiation. Our primary consumer target is, private health professionals that need a solution for communication, data management and sharing for their users/patients. Secondary consumer target is, patients with chronic disease that need a regular treatment follow-up and communication solution towards their health professionals.

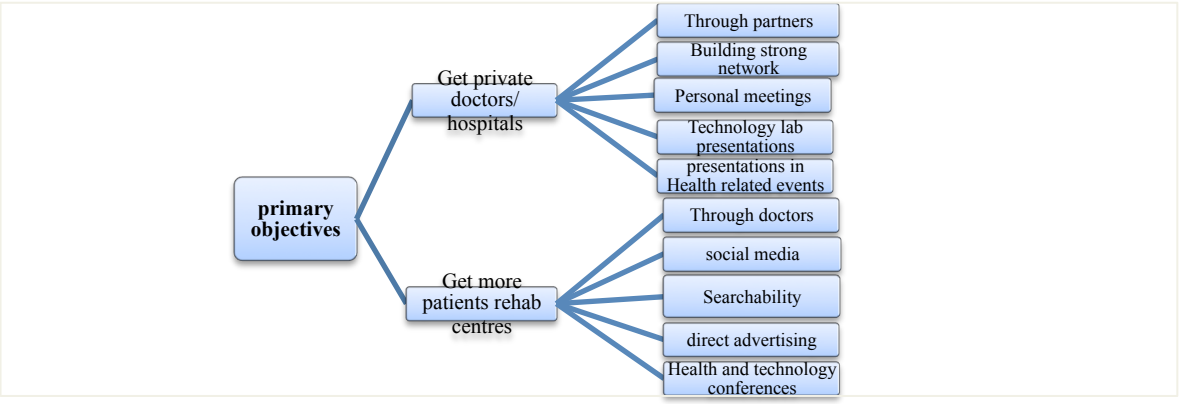



Figure 24*: primary objectives of marketing strategy for Helseboka*

### 3.4.2 Marketing mix strategy

Marketing strategy consists of marketing mix tools that are categorized according to four elements called 4ps: product, price, placement and promotion. The product strategy aimed to capture the available opportunity.

Helseboka being the first mobile healthcare application in Norway is unique and it has competitive advantage as it provides a wide range of solutions at one place. Thus we will use these advantages to attract the potential customers. Moreover, health professional user can customize the system and they can choose the display of front page specifically. However, there is a need for more simplification of the application design for inexperienced technology users. Although it is already user-friendly for huge population and a little complexity is due to high level of security but still it will take some design considerations for this special group of people.

The second element is price. The installation of application is free; the price of different packages is reasonable. It starts from basic, with few features to total package of all features. However, the package can be chosen according to the requirements. If the health professional needs only appointment booking application, they need to buy intro package, which cost a little. Moreover, application is very cheap for patients also. It offers free installation plus only 19nok/month for basic package and 99nok/month for full features package plus in app-purchases. In addition, users can chose the package according to their needs and budget. The table below shows the prices for different packages with different feature groups for Health professionals.

| Price/ person | Fastlege | Booking | Intro | Basis | Journal | Klinnik | Total |
|---|---|---|---|---|---|---|---|
| Time book/be stilling | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Video consultation | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| E dialogue | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Payment solution | | | | ✓ | ✓ | ✓ | ✓ |
| Journal function | | | | | ✓ | ✓ | ✓ |
| Collection form | | | | | | ✓ | ✓ |
| Flow pack | | | | | | ✓ | ✓ |
| Own branding | | | | | | ✓ | ✓ |
| Check-in function | | | | | | | ✓ |
| Total | 0, - | 95, - | 245, - | 345, - | 495, - | 695, - | 2245, - |

*Table 12: Helseboka package prices for doctors*

The application will be distributed to fastlege for free. Moreover, initially the application will be distributed through the partner "HUUBRO" that offers a journal system for cosmetic medicine. The application will be free for first three months. The existing customers of the "Hubbro" would be target to reach and place the application for use. The health professionals can buy the ownership of the application system and they can customize it according to their needs. The application is compatible to Google play and android and will be available in application store in health and fitness category. Free three-month subscription will be offered to the initial users that are approached through partners and also directly patients and doctors through making relations.

The last element of marketing mix is promotion that is a crucial activity of Helseboka. The promotion activities would be presentation of the innovation through real-life events such as health conferences, technology platforms and community meetings. Network building is essential for reaching the potential individuals. Participating in healthcare related events especially the ones that are related to chronic and disabled patients would do networking. The owners of the application are already in healthcare field that would be used to approach and introduce product to other doctors and patients.

| **Product** | **Price** |
|---|---|
| • Solutions at one platform<br>• First mobile healthcare application<br>• Application can be customized | • Free installation<br>• Varied Package price according to features chosen<br>• Different packages according to needs and feasibility<br>• Package are at very affordable price for both patients and doctors<br>• Free three-month subscription to the initial users. |
| **Placement** | **Promotion** |
| • Free distribution to Fast-lege<br>• Placement through partners<br>• Mobile Application stores<br>• Free three-month subscription to the initial users. | • Network building<br>• Participation in real-life events.<br>• Introduce application to own patients and known doctors. |

*Table 13: Table: marketing mix for Helseboka in Norway*

### 3.4.3 Marketing strategy process

The analysis of environmental and SWOT factors revealed the need for a marketing strategy to successfully diffuse the innovation "Helseboka " in the healthcare system of Norway.

Helseboka is a new and innovative application that needs to create a new market. At the same time, the potential market for Helseboka already exist, it can be characterized as very narrow with established relationships and long-term players. The main objective of the marketing strategy is to reach the public healthcare system of Norway but that is the market that has existing relations with established and long-Term players. Thus being a small company with limited service history, it is difficult to enter the public sector directly. Therefore, we have to find a way through other target segments to reach it.

The analysis of internal and external environment together with innovation and competitors highlights few opportunities for Helseboka such as:

*a)* Helseboka is an innovative application, being a first mobile healthcare application; it's new in the market and is demand of the present healthcare system.

b) The population with chronic diseases is huge and it is growing continuously. Helseboka covers all the needs for this group of customers, thus it is the demand of the current healthcare situation.

c) Increasing number of chronic patients and elderly people created demand of proper management and communication system with patients and between doctors. Helseboka seems reasonable solution to meet these health professionals' needs.

d) Thus it seems reasonable to target a few groups of the potential customers initially.

For further development of marketing strategy, lifecycle model of Helseboka is designed and shown below.

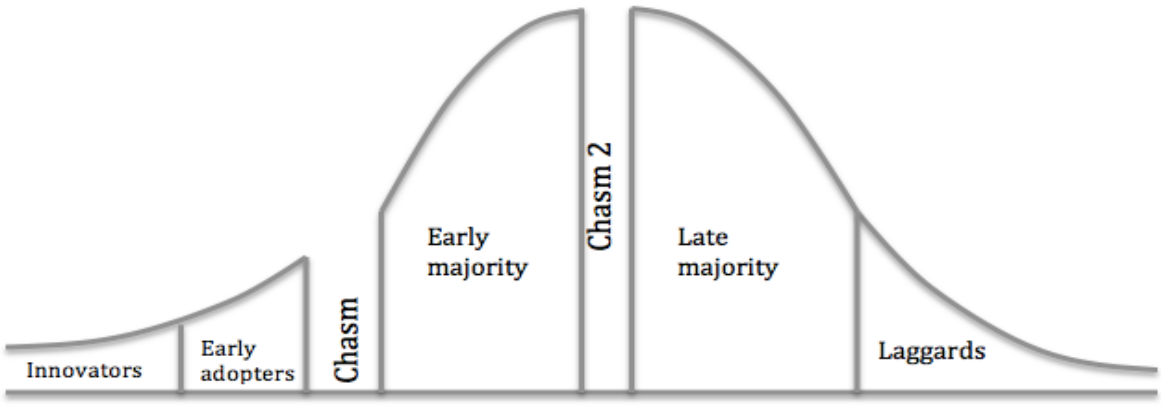



Figure 25*: Life cycle perspective for Helseboka adopted by (Moore, 1999)*

**Innovators**

According to model, the first group is innovators or enthusiasts, who want the newest knowledge and technologies for their activities. For Helseboka, this group includes the doctors and patients that have been part of innovation development process. It includes not just doctors and technicians that directly work with the project but also patients who tested incomplete application and give their feedback and suggestions for further development. They are not actual customers that pay for the service but still they have significant role in the development and improvement of the application and considered as enthusiastic/ innovators. They represent a source of initial product or service references and a test bed for introducing modifications and improvements in the application. Thus next stage is to introduce the product to customers for premarketing.

**Early adopters**

Visionaries are not looking for an improvement; they are looking for a breakthrough. They are ready to test the application even from those vendors that have little or no service history only on the basis of potential they see in new innovation. They want to start out with the pilot project because they are going wherever no one going before. The visionaries' idea is to stay close to the development train and make sure if it's going in the right direction and to be able to get off if they discover it goes wrong direction (Moore, 1999).

Moreover, when application is ready to use, its basic model is distributed free to fastlege and free package subscription for three months through the partner (Huubro), an existing mainstream market company who will put Helseboka in play through its existing channels/ patients. These are the early adopters for the application "Helseboka". The company offered the application to the early adopters before it has the application launched for premarketing and preannouncing. These are not paying customers initially but at the front end of sale cycle, it need to understand the visionaries and give them confidence that application can step up to them and can modify and improve according to their expectations. In the middle, it needs to adopt the application to meet the needs and finally, the careful negotiations for further adoption of the application to make them regular customers. However, we must get very practical about focusing on one application, making sure that it is indeed a compelling one for at least one visionary who is already familiar with us, and then committing to that visionary, in return for his or her support, to removing every obstacle to getting that application adopted (Moore, 1999).

Early adopters represent an opportunity early in the product's life cycle to generate relations and reference. The opportunity comes with a price tag, a high demanding customer who will seek the company's priorities and high risk project that could end in disappointment for all (Moore, 1999). Thus, early adopters can give the application a first big break, if handled carefully. After the completion of development, the next step is to move to the real paying customers, offer it to build business. This is crossing a chasm. The main goal of next stage is to reach the early majority after crossing the chasm.

**Crossing the chasm**

The first suggested way to cross the first chasm is direct sales. As the product is new in the market, it is necessary to have direct sales and contact with potential customers to explain the benefits of the application and need for it. When a product and its functioning are at its best, direct sales is the optimal channel for high tech. It is also the best channel for crossing the chasm (Moore, 1999).

The second way for crossing the chasm is customizing the application to fit the needs of the target customers. As Helseboka has the customization features that makes it easy to mold it according to the needs of different customer groups. Thus, if we offer the packages that fit the target group, by paring it with direct sales would make the path smooth to reach toward the next stage of product life cycle that is early majority. Third, we can use the service history earned from early adopters. The positive feedback from early adopters can be used as reference for the early majority customers that would work as a lead pin for the next customer segment. The lead pin and bowling alley strategy is discussed further in this chapter.

**Early majority**

Early majority tend to be accepted as market leaders by late majority, best thought of as conservatives and rejected by the laggards. Moreover, the application is ready with advance features at this stage. The need is to choose the target segment that offer us a best opportunity not in itself but also offer us an opportunity for further expansion. The basis for this reform is the principle that winning at marketing more often than not means being the biggest fish in the pond. If we are very small, then we must search out a very small pond indeed (Moore, 1999).

For Helseboka, first customer group could be chronic & rare disease patients that are best opportunity. The big population with chronic and rare diseases needs regular follow-up itself and communication with the doctors. The number of deaths with these diseases is increasing thus there is a need for such application that can be used to solve this group needs and Helseboka is especially fit with the needs and provide and advance solution that meet the required expectations.

On the other hand, private doctors (private physicians, physiotherapists, dentists etc.) are the biggest opportunity; it could be another first customer group. With growing patient number and healthcare data, there is a need for proper management of patient records and better communication of doctors with patient and between healthcare professionals. Secondly, it would provide a competitive advantage to attract customers. Helseboka would provide a competitive advantage being a first mobile healthcare management solution and would solve the communication and management issues. However, these target groups could provide the application a solid base for further expansion in market, as these are self-referencing market segments. As according to Moore (1999), To qualify as a "real pond," as we also noted before, its members must be aware of themselves as a group, that is, it must constitute a self-referencing market segment, so that when we establish a leadership position with some of its members, they will get the word out quickly and economically—to the rest (Moore, 1999). Thus, these target groups would be the early majority for Helseboka.

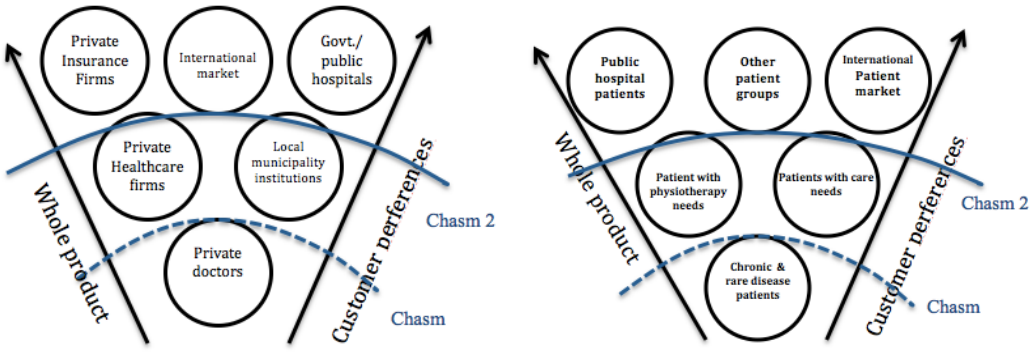
Moreover, if Helseboka would be successful to get these customers and satisfy them, it would carve their path to other market segments and would help to market expansion and build relationships to reach the main objective that is to capture the biggest market of healthcare in Norway: public healthcare and all the population of Norway.

Furthermore, after the very first customers, the early majority will grow with other patient groups such as patients with physiotherapy needs and care needs. While on the other hand, private health related companies such as orthopedics firms, private health insurance firms and finally municipal healthcare institutions such as health care centers, rehabilitation centers and old age care homes. The main interest for these groups would be market expansion and to have a possibility for creating relations, references and service history. The main goal of this stage is to get the potential target segment not only to knock it over but also to create a base for reaching the other segments and finally meeting the main objective.

However, when we try to make the transition from a market base made up of early majority to penetrate the next adoption segment, late majority that is highly reference oriented and highly support oriented. This is indeed a chasm for Helseboka because it is a new company with limited service history. Thus there is a need to cross the chasm.

**Crossing the chasm 2: (Bowling alley & Tornado)**

To cross the chasm between early majority and late majority, We need to reframe our "pond" tactics in the context of a "bowling pin" strategy, where one targets a given segment not just because one can "knock it over" but because, in so doing, it will help knock over the next target segment, and thus lead to market expansion (Moore, 1999). The tool to cross the chasm is called "bowling alley" in which market segments are "bowling pins". The role of the strategy is to create bowling pin market segments for the business. When moving from lead pin to further segments, Then it is necessary to make sure that the transitional plans and content are in place to move from one target market to the next (Lieberman, 2012). In bowling alley, the company builds highly customized solutions based on technology for targeted customer segments. During this process, close attention is given to customer needs and expectations from the solution. Possible bowling Alley scenarios for customer groups at different stages are shown below.




*Scenario 1: Health professionals market* *Scenario 2: Patient market*

*Figure 26: "Bowling Alley" scenarios) for Helseboka, Adopted from (Moore, 1999)*

First scenario shows the possible market segments and its path for healthcare professionals. Being a small company with limited service history, its difficult to reach the public and international sector initially. Thus, private doctors would be the niche segment at start that is

easy to reach and will take attention from government sectors. Next target segments in the way to mainstream market would be health care centers and rehabilitation centers that would lead a path towards public hospitals. Further the base created by early majority segments especially community centers that are small governmental institutions would create service history and their action would influence larger sector such as public hospitals and international market that will create a positive reaction of acceptance as well.

The second scenario shows the patient market. The "lead pin" in this market is chronic and rare disease patients that are growing continuously. In this case, the actions start from highlighted needs of the patients segment, which calls for necessary actions. At early stages, the application is customized according to the needs so it can cover maximum percentage of target segment. At the same time, it will motivate patients with rehabilitation and physiotherapy needs to adopt the application. They will become aware with the facilities provided by application through early customers that will nudge them to adopt the application. The adoption of application by these early majority customer groups will clear the path towards late majority that are other local patients and international patient market. Next important group is cancer patients that have specific needs and application would be customized specifically for this group both local and international level.

At the stages of the Bowling alley, the application would be customized based on its technology for customers in selected vertical markets to get leadership in that group and to motivate further bowling pins. During the whole process of bowling alley, necessary changes in the technology of application and business processes of the company would be implemented till the technology widely accepted. Widely accepted technology will initiate tornado where technology is quickly being accepted as no-brainer choice and is being delivered as standard products rather than customized solutions. Going from bowling alley to tornado requires significant shifts in personnel, organizations and attitudes (Moore, 1998). Helseboka, being a small company would be ready to make necessary transitions quickly for big pay-offs.

The tornado concept in crossing the chasm strategy means the time when the whole product is ready and meets the needs of market and market demands for it. It is the time when company needs to scale up exponentially to meet the market demands. By the time, the tornado begins; the company must be established with the necessary resources to cover the

demand that Helseboka arranged by collaboration with “innovation Norway” and big investors that will provide funding and necessary support during the expansion period of company.
After tornado, the mainstream period is the relative calm period for the business. The whole product is built and proven in the market. The opportunities are big and limited in scale at this stage. The core to leadership position in market is long-term relation with customers with fixed contracts. At the same time, developing the new technologies and reach a new level of expertise is also necessary to beat the competition and keep its position in the market.

**Late majority**

The late majority is the customers that need complete solutions and convenience. This group drives the development of mainstream market. Winning their support not only gives the point of entry in mainstream market but also the key to the long-term dominance.
For Helseboka, In Norway, early majority would be the public sector as it covers majority of the healthcare. Because this group of customers covers a bulk of dollars in the marketplace, the rewards for building relationship with them are very much worth the effort. These relations will help in market expansion locally and especially, making it easy to go in the international market with the support and trust of Norwegian public healthcare.

We will use the references and support from early majority. Furthermore, We need to attend digital healthcare specific trade shows, conferences and direct contact with governmental healthcare management people to introduce the application and explain the services and need for it in health care system. The main goal of this stage would be to reach the big proportion of Norwegian healthcare market. However, if such significant market players are reached, it will be a powerful advantage for further growth. The further growth in the late majority points toward the step in the international market. The international market could be the first late majority target segment but if we go after or along with the Norwegian public market, it would be easier and successful path forward due to the value added being a part of governmental healthcare sector.

**Laggards**

The last stage is the laggards or skeptics that are barely interested in technology market. They do not participate in high tech marketplace, except to block purchases. The laggards point

continuously the discrepancies between sales claims and the deliverables. These discrepancies create failure grounds for customers that spread through word of mouth and can lead to lost market share. Thus the primary function of marketing strategy related to laggards should be to neutralize their influence. On the other hand, laggards can pin point our wrong sides that we can improve further. These companies can be reached by creating a trend in the industry or governmental obligations. This group of customers can be reached just by the long run strategy, which includes actions from state organizations for the betterment of society and by creation of a healthy trend in favor of digital healthcare and Helseboka.

### 3.5 Conclusion

The market study chapter answers the research sub-question: 2, who are the stakeholders of Helseboka in Norway and what is the marketing strategy for these stakeholders? The customer analysis divides the customers into three groups, patients, health professionals and management personals on the basis of different motivations, unmet needs and value created by Helseboka for these groups. Helseboka has competitive advantage as it provides first mobile healthcare application with all the features at one place. Mostly applications focus on single functions that can be considered as indirect competitors. However, in Norway, "e-journal system and Helserespons" are main competitors but Helseboka have still competitive advantage over them. Moreover, The new and improved technological, psychological and economic attributes provided by Helseboka as compared to existing healthcare industry enable it to create new demand and new market.

The environmental PESTEL analysis, SWOT analysis and strategic framework show the opportunities for Helseboka in the Norwegian healthcare market due to recent governmental healthcare digitalization strategies. At the same time, growing number and needs of chronic & rare disease patients is another opportunity for Helseboka. However, being a small and limited service history is a weakness that makes its entry into healthcare system difficult, especially, the public healthcare sector that is characterized narrow with established relationships and long-term players.

However, the main objective of Helseboka is to cover the biggest market of Norway that is public healthcare. For reaching the public healthcare sector and biggest market of patients, market strategy had been built. The crossing the chasm strategy is utilized as it basis the way

of small companies with limited history and gives the tools to operate in different market segments. The direct sales and customization of application on the basis of technology were the most suitable settings to reach early and late majority. Two other possible scenarios were also planned for crossing the chasm such as “Bowling alley and Tornado”. Private doctors were chosen “ lead pin” from the health professionals market segment and chronic disease patients from the patient market that are easy to reach at start and they can also influence other sectors. However possible terms and details of the project will be discussed in the next part of the project that is business plan.

# Chapter:4

## 4. Business plan

### 4.1 Executive summary

***Project brief description***

Helseboka is a digital healthcare application. It is first mobile healthcare application in Norway that provides a package of the required healthcare features at one place that also meet high procurement standard. It provides high-level security and safety and passed the Information Security Standard, ISO-27001 certification, and using Level 4 security for all patient communications and data sharing. It provides security and privacy with ease of usability, evidence based and clinical integration.

The company initiated by two professional doctors and supported by innovation Norway. The idea for innovation started during the clinic routine by realization of disconnection between patients and doctors. The core of the innovation project is to provide communication and data sharing solution to enable health professionals and patients work as a team.

***Competing platforms***

There are direct and indirect competitors distinguished on the basis of single and multiple features provided by them. Helsenorge and Helserespons are two main direct competitors in Norway. Helsenorge provides journal healthcare function while Helsenorge provides communication solution for patients and doctors. In comparison to these two competitors, Helseboka provides both advance communication and journal function along with new features not available before in one application. Moreover, indirect competitors are the applications with single features.

***Potential customers and market***

Since initial focus of the project is Norwegian healthcare system and then it will enter into the international market in future. There are two groups of users on the basis of different needs and motivations for each group, one patient and second, and health professionals. Third group is the benefactors that are healthcare management people that are involved in direct buying decisions and management of healthcare system.

However, to enter the Norwegian healthcare market, Helseboka will be targeting private doctors and private healthcare companies at start that has fewer limitations to enter. Moreover, service history and networks build through small private customers would help to enter the local municipalities that will finally lead to the main target, public healthcare sector in Norway. On the other side, first group of customers from patient group would be chronic disease patient with greater number then patients with care needs. Finally cover all patients local and international market.

***Project status***

The project is in continuous research and development phase. New features and services are added continuously to the application. The work is also going on to build the international model of the application. The only hurdle in the way of international model is security compatibility of application that is different for each country and efforts are being done in technological field to fulfill the requirements. Moreover, there are some international proposals from different countries that will be considered as soon as the model is ready.

***Investment summary***

The project started with the personal savings of the owners and then moved on with friends and family investments. It received 2 million NOK grants from innovation Norway. In addition, a huge investment came from big investors and partners that made the development of application and other business activities possible. The application will be launched in mid of 2020, by this time; a network of potential customers will be built for long-term relationships. The initial team consists of software developers and few other staff members.

***Financial summary***

At the start of the project, the initial software development costs and business startup costs will be met by investments and most of the tasks such as marketing and accounting activities of the company would be outsourced in initial three years and few employees will be hired till the company has a stable profit stream. After three years, the company would be in position to have its own marketing and accounting departments and people to handle activities. The marketing budget will be shifted toward hiring more people and expand the company and its operations that would be a step towards international market.

### *4.1.1 Mission*

The mission of Helseboka is to make both health professionals and patients better able to play on teams. Through unique technology, it provides self-empowerment to patients and efficient

management solution for health professionals that results in efficient health and healthcare system.

### *4.1.2 Required activities for success*

There are some key steps that will be instrumental in creating a sustainable business. If these central points will be followed, the likelihood of the success would increase significantly.

- Building long-term relationships on all levels of marketing and business activities.
- Enter into partnerships or make connections in the local municipality healthcare sector in Norway.
- Make collaboration or involve in healthcare research activities to make position in Norway's healthcare system and for further global support.

### *4.1.3 Marketing Objectives*

The project has following marketing objectives that it will pursue for the long-term success of the business

- Become a leader in private and municipality healthcare system within 2.5 years.
- Capture the biggest healthcare sector in Norway that is public healthcare system.
- Gain stable financial and business position within 3-4 years to be able to enter in international market.

### *4.1.4 Core components of the project*

There are following key elements for the successful business plan of Helseboka.

- Developed by leading developers team
- Owners of the project are the part of healthcare (working doctors), they understand the problem very closely.
- Helseboka has origin in Norway; application is made according to the needs of healthcare in Norway.
- Got funding and support from Innovation Norway.
- Application is ready for use and will be launched in mid of 2020.
- Two security penetration tests was performed but without hackers succeeding to get into the system.
- Application model would be soon available for international market.

## 4.2 Business idea

### *4.2.1 The problem*

Significant care and communication gap between doctors and patients is one problem that impedes the healthcare system efficiency. Moreover, Increasing healthcare costs is another important problem for the healthcare system.

Specifically, There are unmet communication, data access, and data sharing and management requirements for patients and health professionals. Therefore, there is a need for a system/application that provide fast and convenient communication solution; data access and management solution and treatment follow up solution at one place. Basically, there is a need for a solution that bridges the communication gap between health professionals and patients and within different healthcare professionals and should be able to reduce the healthcare cost as well. The issues of user's of the system, which are health professionals and patients in present healthcare system, are shown below in the table.

| **Health professional's issues** | **Patient's issues** |
|---|---|
| • Patient follow- up<br>• Information and time management<br>• Health record access and management<br>• Fast and efficient communication with patients and other health professionals<br>• Administration task management and time saving | • Treatment follow-up<br>• On-time communication with doctors<br>• Fast and convenient communication<br>• Context-dependent knowledge sharing and collaboration<br>• Self- empowerment<br>• Health record access and sharing |

*Table 14: Issues of patients and Health professionals*

### *4.2.2 The Solution*

The key solution is to create and facilitate a network or healthcare system with connected healthcare providers, stakeholders and patients to provide efficient healthcare that is provided by digital application "Helseboka".

Helseboka provides a solution for fast and convenient communication, data access and sharing and health and patient data management for health professionals and patients. Thus, Helseboka bridges the communication, data sharing, and access and management gap between different stakeholders in the healthcare system. It is the first mobile application that provides advanced communication, medical journal, e-diagnosis, information and data management solution at one place. The application provides level 4 securities for all doctor patient communications and ISO-27001 certified.

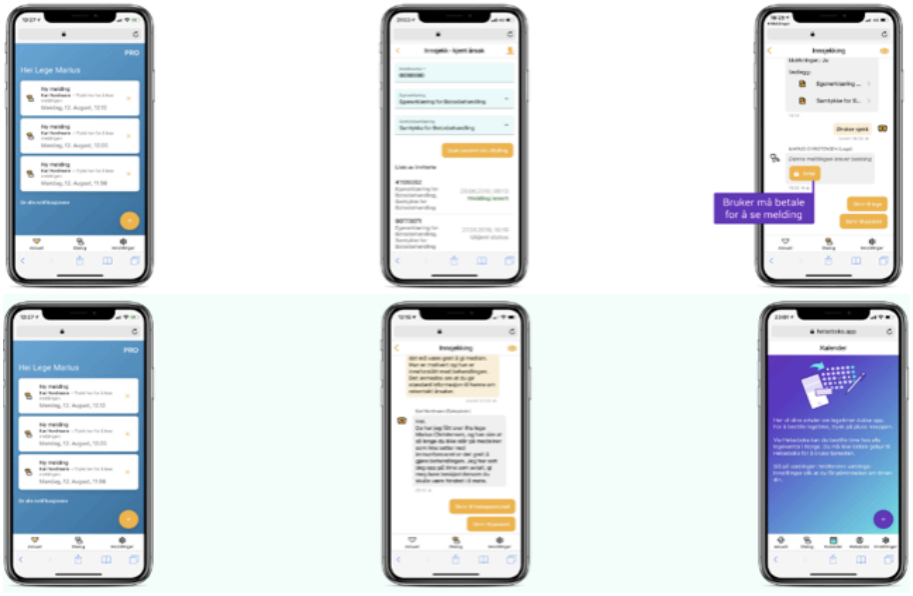



*Figure 27: screenshot of the features of Helseboka, source:( https://helseboka.no/pro)*

It provides facility to doctors to follow-up their patients, enables fast and convenient communication with patients and with other health professionals. In addition, it saves time and enables efficient information and data management. Customization and ownership features of the application gives freedom to doctors to change the front page of application and can use this application with their name.

On the other hand, it enables fast and convenient communication of patients with health professionals that save time, money and energy. Moreover, it provides fast data access, sharing and secure storage in patient's own cloud. Heavy medical documents are transferred within one minute from health system to patients cloud data. Moreover, e-diagnosis features enable patients aware of their health better. In addition, calendar, appointment booking and reminder features of application facilitate patients to keep track of their health and treatments. Overall, it empowers patients and provides them opportunity to involve in decision making about their health.

Therefore, it results in prepared, proactive healthcare professionals and on the other hand, provides informed, activated patients that consequently result in the improved healthcare outcomes in the form of efficient and cost effective healthcare system and health results.

### 4.3 Value proposition

The customers can be divided into two segments on the basis of values provided to them. First segment are users and second are benefactors.

First segment, the users of the system is, the patients and health professionals that use the system for communication, data access, sharing and management according to their needs. One, users group is, patients that need a solution to keep track of their health/ treatment and to access and share health data. The other user group is, the doctors that need a solution to keep track of their patients, manage patients and health records of their patients and solution for communication with patients and other health professionals in the system.
The second segment includes healthcare management as benefactors, which needs a cost-effective healthcare solution that can provide features to make the healthcare system efficient. However, in some cases, same persons can play both health professionals and management roles.

#### *4.3.1 Value proposition for users*

The value proposition for patients is that it connects the patients with their care providers fast and at the comfort of their home. It reduces unnecessary transportation costs and time. The patients can book online appointments and contact doctor through messages, video calls and video conferencing with a group of specialists at a time and empower patients by enabling them participate in decision-making. It enables fast and secure digital access and sharing of medical reports and data. Moreover, it helps patients to follow-up the treatment through appointment reminders.
On the other hand, the value proposition for health professionals is that it enables fast and efficient communication with patients and other health professionals. It provides management solution for proper management of patient record and medical data that helps to save time and energy and also enable efficient management of the work. Similarly integrated payment solution, customization of solution on one hand, reduces administrative tasks and on the other hand, gives freedom of work management.

#### *4.3.2 Value proposition for benefactors*

The value proposition for benefactors is that it provides a cost- effective digital healthcare solution that also improves health outcomes. Thus, it reduces the cost of healthcare and provides efficient healthcare system to satisfy customers. This value provides the opportunity for healthcare management to enhance the image and quality of the system.

#### *4.3.3 Value proposition for society*

The Helseboka allows the patients to be involved and informed about their healthcare decisions thus empowers the patients that improve their lives. The involvement of patients in

decision-making improves coordination and planning in healthcare that in turn contributes to the improvement of overall healthcare towards society. Helseboka provides the opportunity to patients to communicate and discuss health conditions directly and on time with healthcare providers and saves transportation cost and time. Thus involved patients can play an active role in healthcare system that transform indirectly into healthy society.
Helseboka has the potential to reduce the cost of healthcare. However in Norway, the cost of healthcare is the responsibility of the government and the government covers the cost by public taxes. Thus, Helseboka lower the cost of healthcare and reduces the burden on society, by implementing radical features of innovation such as Helseboka data storage reduces the cost of record sharing. In addition, it reduces the number of patient's visits and saves the unnecessary costs of manual handling.

### 4.4 Competition

Single and multiple healthcare technological features provided by different applications can identify the competitors of Helseboka. There are mostly indirect competitors exist in the market that provide single feature such as some applications provide only communication feature, other provide only data access and sharing and similarly there are some applications that provide healthcare management for patients or patients separately. However, there are few companies, which provide multiple services regarding healthcare in one application that can be considered as direct competitors locally and internationally. The potential competitors and core features provided by them are listed below.

| Applications | Core features |
|---|---|
| **MD click** | Tool for data sharing and care integration between care professionals |
| **Genie MD** | Care team feature to securely communicate, maintain and share personal health records for both patients and health professionals |
| **IMQ** | Share reports with patients, notify appointments, video consultations |
| **Helserespons** | Online solution for patient dialogue, digital mail and online timetable |
| **Helsenorge** | Patient journal for data storage and sharing, and can send message or book appointments |

*Table 15: competitor's technological focus*

However, competitor's analysis shows that there is no such competitor who provides whole package of needed services at one place that Helseboka provides. It is assumed that Helseboka is a potential mobile healthcare application that provides a package of required services at one place. The table below compares the applications on the basis of features provided. It is clear from the table that Helseboka position on the high scale as compared to its global and local competitors.

| Technology features provided | Low → High |
|---|---|
| Online messaging | |
| Video conferencing | |
| Video- consultation | |
| Data access and sharing | |
| Appointment booking/ calendar | |
| In-check function | |
| Security level | |
| Integrated payment system | |
| One-patient one record | |
| Customization of solution | |

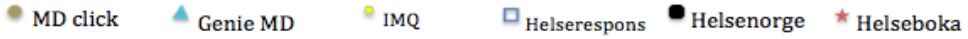



*Table 16: features comparison between Helseboka and competitors*

To provide a better picture, two main competitors in the initial focused market of Norway are compared with Helseboka on the basis of valuation provided to features by customers. Helserespons and Helsenorge are selected due to their potential competiveness and association in the market.

| Values for customers | Low → High |
|---|---|
| Technological features | |
| • Uniqueness of technology | |
| • New feature addition | |
| Psychological attributes | |
| • Easiness of use | |
| • Standard of Privacy features | |
| • Security level of data storage and sharing | |
| Economic attributes | |
| • Less Training costs | |
| • No/ less Implementation costs | |
| • Less Maintenance costs | |
| • Reduced Overall costs | |

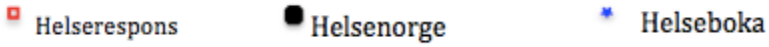



*Table 17: comparison of "valuation attributes" between Helseboka and main competitors*

The table above shows the uncompetitive position of Helseboka as compared to its main competitors due to high valuation provided by customers to its attributes.

However, the main challenge in the private market would be Helserespons that have existing connections in the market. The main task of Helseboka would be to reach these customers by presenting new technology and creating new demand. Second, main challenge in the public healthcare system is "Helsenorge" that have long-term relationships with the customers. Thus

main task would be to present new features to make a new place. Another option is to turn Helsenorge as partner and become a second provider in the digital healthcare public sector along with Helsenorge. However these could be possible scenarios for entering the private and public healthcare sector to reach the potential customers.

### 4.5 Market segmentation

The market for Helseboka has been segmented into three groups, patients, health professionals and healthcare management on the basis of value proposition provided to them. However, for market quantification, health professionals and management would be considered in the same group because both are providers of health care. In order to define the number of potential users in Norway, the relevant health statistics can be utilized.
The available statistics for chronic disease patients in Norway display the adjusted life years instead of number of population. The data from labor force survey shows the disabled proportion of population between the ages 16-66 is 17% in 2017. The potential users from this group would be approximately 600,000. The figure below shows the potential patient market segments.

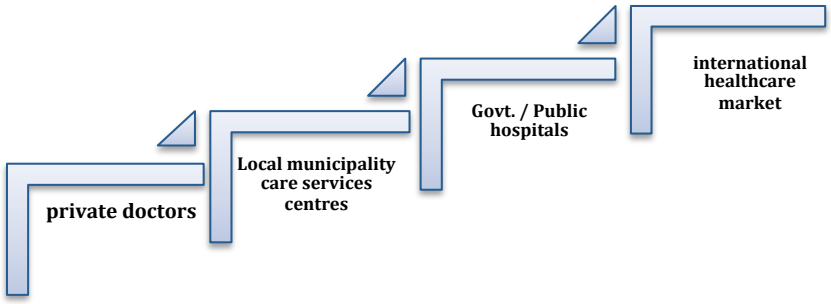



*Figure 28: Health provider's market*

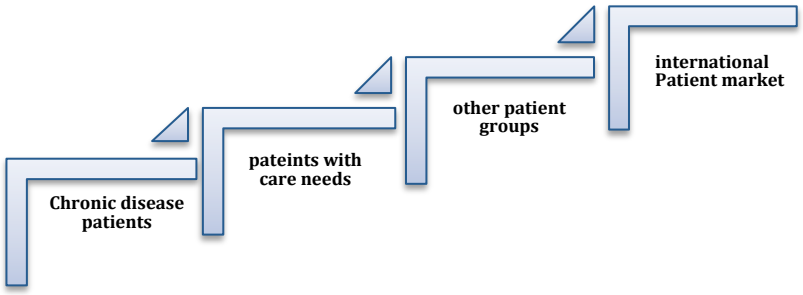



*Figure 29: Patient market*

On the other hand, health providers market as shown in the figure above contains primary group of private doctors. The private doctors include private practitioners, physiotherapists and dentists etc. Private doctors all together are 1/3 of the total doctors. Total number of

physiotherapists in Norway is 7,321 that are potential users of application. Next potential users are local municipality healthcare centers in Norway. The biggest 2/3 proportion of healthcare providers are govt. hospitals that is the main potential customer group. Finally, international, private and governmental healthcare market is the largest group that will be reached.

### 4.6 Marketing strategy process

The Marketing strategy is explained in the picture below, consist of marketing activities at different stages of the marketing process according to the set goals. This strategy is formulated to reach the main objective of covering largest customer groups. The activities of getting more patients and getting more health providers goes parallel in the marketing strategy process that is shown in the figure below.

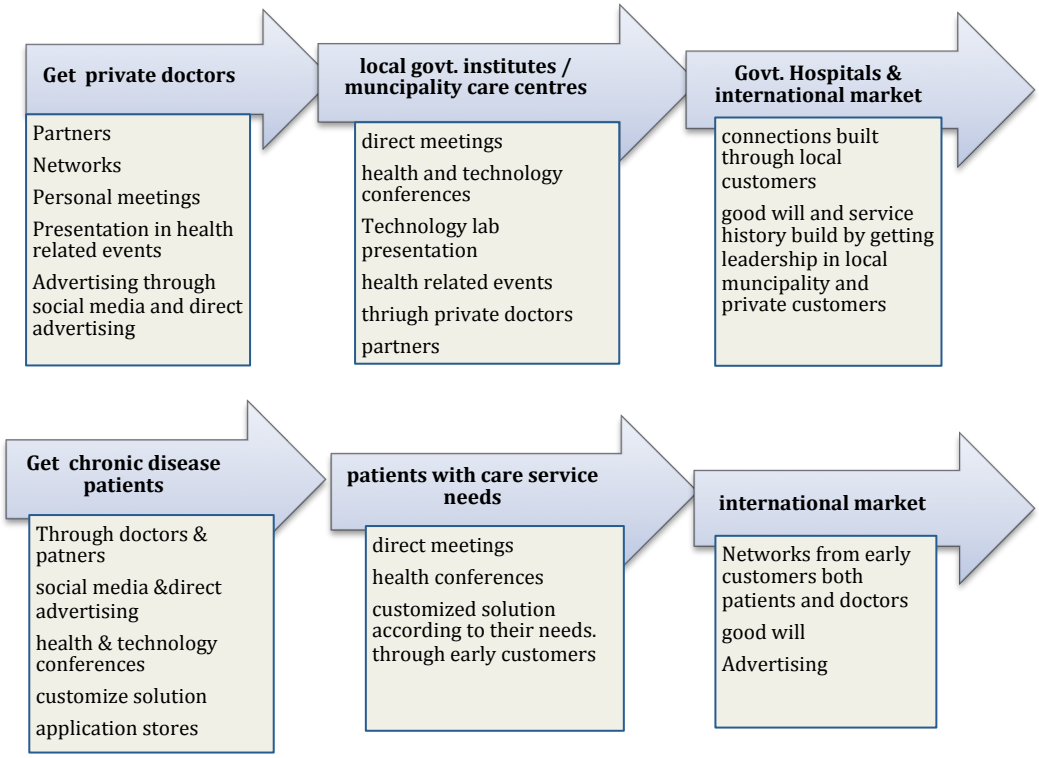



*Figure 30: Marketing strategy process for Helseboka*

The first customers from the health professional's segment would be private doctors that would be reached through direct meetings, building networks, through partners and presentations in health conferences and events. Next, the local municipality institutes such as healthcare and rehabilitation centers would be reached through various networks. The service history and good-will build through these customers would be used as a bridge to reach and

convince largest group of customers that are government and public healthcare sectors/ hospitals.

Chronic disease patients are a potential group of customers that would be approached through partners, social media, application stores and different healthcare events. The customized model of application according to customer needs will be used for targeting different groups. Next main customer group would be patients with regular care needs such as rehabilitation, physiotherapy needs patients and old people that would work as a step toward the large group of patients in Norway and further for international market. The marketing tools used during the marketing strategy process are explained in the marketing chapter of this thesis.

### 4.7 Business model

The business model for Helseboka is presented using business model canvas by (Osterwalder's and Pigneur, 2010). The business model shows different stakeholders of Helseboka and their roles in the activities of the successful diffusion of application in market. The business process starts with selecting the customer segments and identifying their needs of each segment.

The core of the business model is the value proposition created by Helseboka according to different segment needs that is divided into three parts, patients, health professionals and healthcare management personals. The channels that can be used for delivering the application are mobile, desktop and website. The application is delivered to customers through partners, by direct sales and free distribution to customers.

The revenue streams comes from selling subscription packages after free installation of application and selling the ownership of the system that can be customized according to needs.

Innovation Norway provided potential and credible research & development support to the company. Moreover, "Huubro" is a professional partner and investors that have network of patients in Norway and they will help in distribution of the application. These partners are also involved in key activities such as research & development and marketing. There are some valuable investors and their names are not mentioned here but they invested a handsome amount in project.

Key resources that are necessary to develop and grow the project are software developers, marketing & sales persons, partners, networks and most important one, the investments that feed the project. Lastly, costs such as software development cost that is huge in amount and other compensations such as, wages, marketing and operational costs that has to pay in order to get the key resources. The business model canvas figure is shown below.

<table>
<tr>
<td rowspan="2">Key partners<br><br><u>Research & development partners</u><br>• Innovation Norway<br><br><u>Investment and distribution partners</u><br>• Huubro and other investors</td>
<td>Key activities<br>• Software development<br>• Customization of solution<br>• Networking<br>• Marketing through various channels<br>• Help service</td>
<td rowspan="2">Value proposition<br><br><u>Value for Health professionals</u><br>• Fast and easy Communication, data access and sharing with patients and other health care persons.<br>• Management of patient records at one place.<br><u>Value for patients</u><br>• Fast and convenient communication, data access and sharing with healthcare professionals.<br>• Treatment follow-up and self management<br><u>Value for management</u><br>• Low cost of healthcare system<br>• Efficiency of the healthcare system</td>
<td>Customer relationships<br>• Personal service<br>• Application subscription<br>• Software download</td>
<td rowspan="2">Customer segments<br><br><u>Doctors</u><br>• Private doctors healthcare centers<br>• Private insurance companies<br>• Public hospital doctors<br><br><u>Patients</u><br>• Chronic disease patients<br>• Rehabilitations centers<br><br><u>Healthcare management</u><br>• Private hospitals and companies<br>• Governmental hospitals</td>
</tr>
<tr>
<td>Key resources<br>• Software developers<br>• Marketing and sales persons<br>• Partners<br>• Network<br>• Investments</td>
<td>Channels<br><br><u>For delivering the application</u><br>• Mobile application<br>• Desktop application<br>• Website<br><u>For reaching the customers</u><br>• Direct meetings,<br>• Conferences<br>• Through partners<br>• Free distribution to fast lege.</td>
</tr>
<tr>
<td colspan="3">Cost structure<br>• Software development cost<br>• Employee wages<br>• Marketing and operational costs</td>
<td colspan="2">Revenues streams<br>• Free installation<br>• Monthly package subscriptions<br>• System Ownership fee</td>
</tr>
</table>

*Table 18: Business model canvas for Helseboka adopted by created by Osterwalder and Pigneur (2010)*

### 4.8 Milestones

Helseboka is currently in the development stage. The project received approx. 2 million NOK from Innovation Norway for research and development and they are also ready for further support for the project. There are also some other investors and partners available to meet financial requirements of the project. Moreover, the participation of credible investors such as innovation Norway will help to attract other investors in future if needed. Thus, financing is not an issue, which is an advantage for the growth of the project. Further more, in future, at

least from 2021, it is expected that the project will start stable profit ratio to meet the international project expansion needs and dramatic profit growth is expected after entering the international market.

During last year, the market has been prepared for Helseboka. The relationships with customers in the form of early agreements, negotiations and first contracts are built. The product will be launched in mid 2020. During this year, the technological features of the application will be customized according to different target customer segments that are basically from private sector. The serving to healthcare sector will start from 2021, by targeting different municipal institutions that will serve as base to the largest healthcare sector in Norway that is public sector that, will be served from the end of this year and focus will continue till next year to capture maximum share of it. The development of international model will start next year and will continue along with customization of technological features according to international market needs. After development of international model, company will start serving the international market. Continuous research and development is part of project throughout the period. The figure below shows the financial and project milestones of Helseboka.

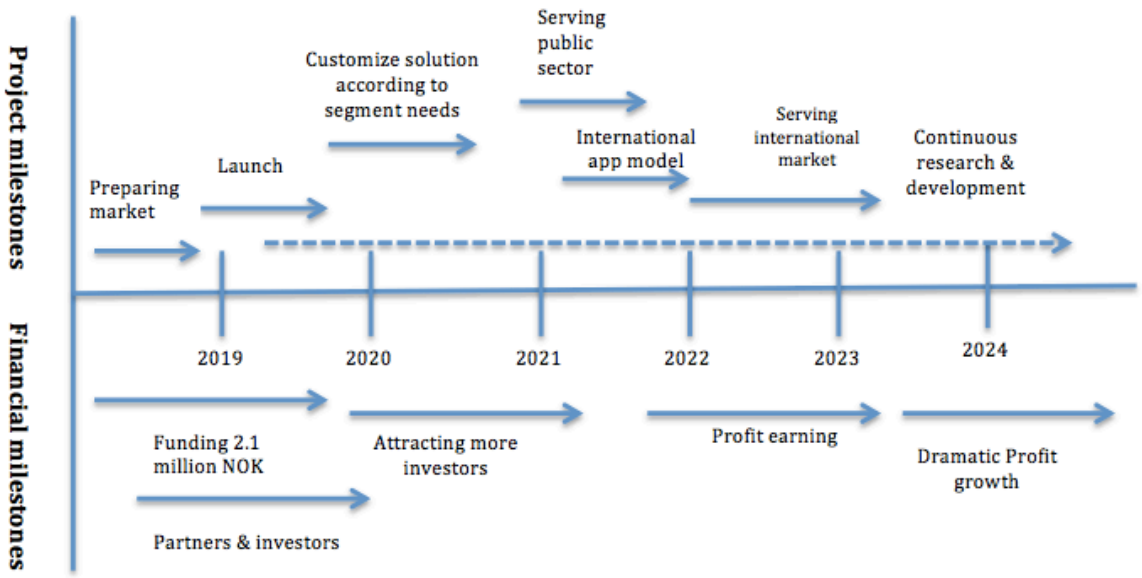



*Figure 31: Milestones for Helseboka*

Furthermore, in the milestones, there will be development according to changing needs and technological requirements to beat the strong competition that is expected after three years

and further. The company will focus to continue its leadership in market with continuous technological and organizational research and development activities. The early research and development expenses will be met with investments and further it will be aided with future revenue streams along with investments.

### 4.9 Financial plan

The financial projections for Helseboka for five years starting from 2020 to 2024 are presented in this section. Since, the work on the development of the application has been started two year ago in 2017 and now the application is ready for launch in the mid of 2020, thus the author started the revenue projection from July 2020. In the start of year, the market would be prepared by offering three month free subscription and distributing free to fast lege and by using different marketing tools mentioned in the marketing chapter of tis thesis.

The company started with initial personal capital of 30,000 and then got family and friend's investments up to five hundred thousand and received grant (2.0 million NOK) from innovation Norway. The Helseboka got short loans (2 hundred thousand NOK) and got investors and partners that contributed to capital almost (10 million NOK) that was enough capital to meet startup capital requirements such as biggest cost of software development and other business setup costs. The wages of the software development team are included in the software development cost. It can be seen in the capital and requirements section of the appendix 2 of the thesis.

The estimated financial activities in operating income statement shows the loss in the first year that is because actual sale started at the second half of the year and first half of the year is spent in preparing the market. This loss would be covered by the capital available and would be compensated with the next year profit, when the company will start earning profits by entering into the stable group of customers as local municipalities and other private companies. The projected profit of 5 years for Helseboka is presented in the figure below.

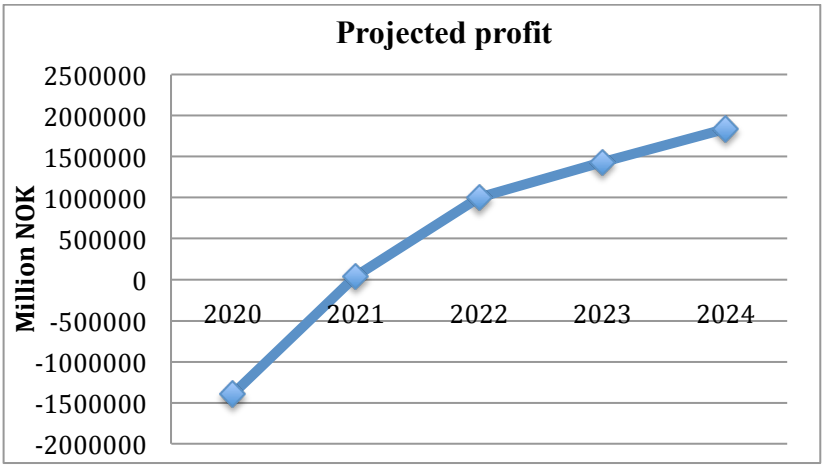



*Figure 32: Projected profit of 5 years for Helseboka*

However, the figure above shows the stable amount of profit in the year 2022 where continuous stream of revenue will start from the customers and that would cover the costs and earn profits that will lead the company to take big step of entering the public sector in 2023, with the help of local governmental customers that would be a biggest achievement and would provide a solid financial base and for company's international expansion. Thus, tremendous profit growth can be expected after entering the international market starting from year 2024 to onward.

However, at the first year, the revenue is very little. It is because, the product will be launched in the mid of the year and also it takes time to make a customer base. Thus, to keep the expenses low at start, company owners will work and few employees will be hired. The large amount will be spent on the marketing activities. The marketing activities will continue tremendously in the second and third year. It can be seen in the financial income statement of Helseboka AS below.

| Income statement<br>Helseboka AS | | | 2020 | 2021 | 2022 | 20223 | 2024 |
|---|---|---|---|---|---|---|---|
| Sales revenue | | + | 438643 | 2697066 | 5724880 | 6389438 | 9864338 |
| Cost related to services sold | | - | 60000 | 240000 | 876000 | 1320000 | 2600000 |
| Gross profit | (A) | = | 378643 | 2457066 | 4848880 | 5069438 | 7264338 |
| Operating costs (per. year): | | | | | | | |
| Wages - employees, monthly salary x 11 | | | 585609 | 875609 | 1167500 | 1167500 | 2110000 |
| Wages - owner, monthly salaryx 11 | | | 734391 | 734391 | 760000 | 760000 | 760000 |
| Employers' national insurance contributions | | | 67320 | 82110 | 98302 | 98302 | 146370 |
| Vacation pay | | | 158400 | 193200 | 231300 | 231300 | 344400 |
| Rent | | | 55000 | 60500 | 66550 | 73205 | 80525 |
| Telephone, mobile, fax, internet, electricity | | | 2739 | 2739 | 2739 | 2739 | 2739 |
| Car expences, leasing, gas, etc. | | | 20500 | 20500 | 20500 | 20500 | 20500 |
| Research and developement costs | | | 41600 | 101600 | 221600 | 121600 | 221600 |
| Intellectual Property Rights | | | 5000 | 5000 | 5000 | 5000 | 5000 |
| Marketing (advertising, etc.) | | | 80000 | 180000 | 480000 | 100000 | 520000 |
| Accounting | | | | 120000 | 375000 | 475000 | 475000 |
| Depreciation | | | 5000 | 5000 | 5000 | 5000 | 5000 |
| Sum operating costs | (B) | | 1755559 | 2380649 | 3433491 | 3060146 | 4691134 |
| Operating results | (C = A-B) | | -1376916 | 76417 | 1415389 | 2009292 | 2573204 |
| Interest costs - loan | | | 19000 | 19000 | 19000 | 19000 | 19000 |
| Interest costs - other (bank overdraft etc.) | | | 0 | 0 | 0 | 0 | 0 |
| Interest income | | | 0 | 0 | 0 | 0 | 0 |
| Sum financing costs/(revenue) | (D) | | 19000 | 19000 | 19000 | 19000 | 19000 |
| Earnings before tax (= Res. for pers. selskap) | (E = C-D) | | -1395916 | 57417 | 1396389 | 1990292 | 2554204 |
| Tax – 25 % of earnings before tax | (F) | | 0 | 16076,76 | 390988,92 | 557281,76 | 715177,12 |
| Net income (for companies organized as AS) | (G = E-F) | | -1395916 | 41340,24 | 1005400,08 | 1433010,24 | 1839026,88 |

*Table 19: Five-year income statement for Helseboka*

However, in 2023, when its expected that company will start earning stable amount of profit, then the company will hire more people and will establish own marketing and accounting departments. Therefore, after third year, the marketing budget will be spend on international marketing activities to prepare international market and more people will be hired to manage the increasing burden of work in the company.

Moreover, in 2023, Helseboka would be financially stable to meet the marketing costs and other costs related to international expansion. The same will continue in 2024 and even more people will be hired to manage the international work. The estimated international application model development cost is considered as the part of research and development costs. However, the main software development cost is met at the start of the business while research and development will continue the whole projected time and appropriate amount will be spent on application feature developments.

Moreover, Maintaining a positive cash flow for a business is very important to manage the ongoing tasks. It is significant for a business to keep its cash flow positive not only the first year but also first period of operating business. After meeting the startup expenses, the company will have 2.3million NOK funding left from the capital. This capital will be used for meeting further business operations thus, the graph shows positive cash flow even first year where the actual net income is negative but company have cash to manage further operations.

The cash flow graph shows down trend at start but it started going up again when company started earning stable revenues from second year which fluctuate a little at one point but overall showing positive cash flow further.

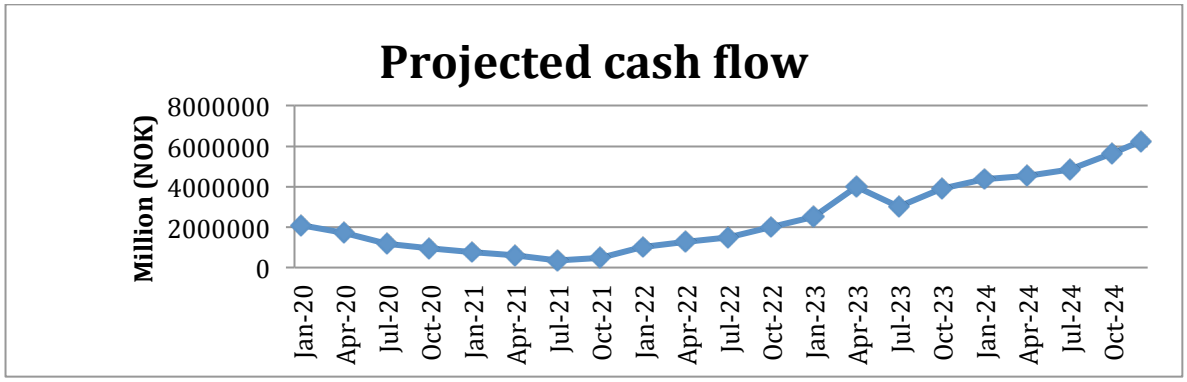



*Figure 33: Projected cash flow for Helseboka AS*

### 4.10 Management team

In order to lead the company, there are many roles needed. The general manager that has background in healthcare is also one of the owners of the company. General manager will take care of the management chores of the project. The second person that is also one of the owners is the assistant manager has background in medicine that will work with the technical matters, will lead the engineers and data developers' team. Next engineer's team, which is data management engineers, system developer and system engineers will work under the supervision of assistant manager and will work on the research and development of the application. Marketing and strategy consultant will keep the marketing activities on track. Although company outsourcing marketing activates in first year when its needed tremendous involvement in this area. Company's marketing department will be established with time and new members will be hired. Accounting activities are also outsourced from outside company. Company's personal legal advisor will deal the legal matter of the company.

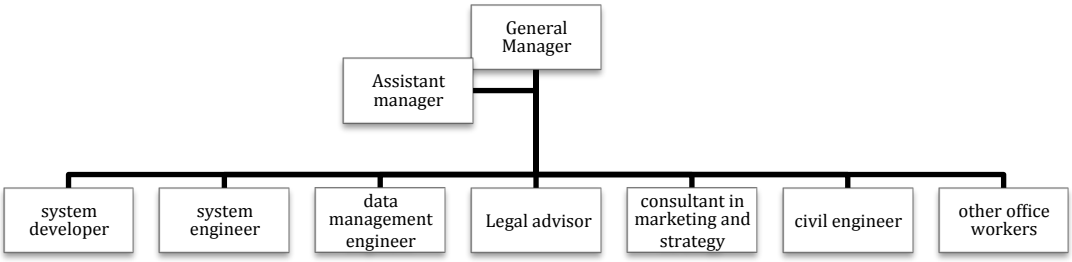



Figure 34*: Company's necessary team members*

Lastly, there are some other employees that are also important for the company such as receptionist, online service members that help to run the tasks of the company smoothly and deal with customers directly.
The chart above shows the necessary members of the team that are working with the company. However there are some employees that have part time contracts with company and working on project tasks from outside.

### 4.11 Exit strategy

In the best scenario, it is expected that the company will start generating positive cash flow stream after capturing the public healthcare sector and international market during 4-5 years and would be able to pay back any loans. The company will invest the profit to grow the company.
Moreover, in normal case, the company will consider expansion through merger with big company. This will help to expand by offering better services, breaking into new market and getting a competitive edge over others.
However, in the worst-case scenario, the company will buyout/sold to other big company and will cover the costs of startup at least.

### 4.12 Critical risks

The risk factors that can affect Helseboka in future, with the probability of happening and extent of the impact on the company are shown in the table below. The preventive measures that can be taken to save Helseboka from these future risks are also suggested here.

| Risk factor | Probability | Impact | Preventive measures |
|---|---|---|---|
| Changes in governmental rules and regulations in the healthcare sector and procurement issues | High | High | Discussion with the governmental members about changes and make efforts to fit the procurement standards. |
| Due to complex and digital innovation, there is probability of Intellectual property rights infringement | High | High | Get patents, copy rights for new features and designs of the application |
| As a technology company, Helseboka is also exposed to risks associated with shifts in technology and resulting changes in the competitive landscape. | High | High | Continuous research and development in technology to cater the changing technological shift and meet the evolving needs. |
| New investors if not attracted in future, it would be hard to expand the business | Moderate | High | Build strong relationships with existing investors and work on the positive future outcomes that will satisfy existing investors and will attract new investors to help business expansion. |

*Table 20: table of critical risk factors*

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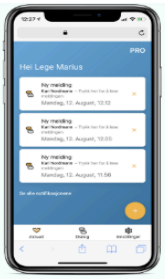
# Appendices

## Appendix 1: Features of Helseboka


*Figure 35:screen short of customization features of Helseboka*


*Figure 36: screen short of dialogue features of Helseboka*


*Figure 37: screen short of Journal system features of Helseboka*

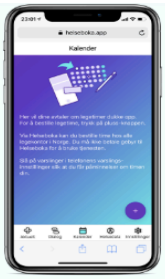


## Mobilt journalsystem

- Lagring av journalnotater på ubegrenset antall pasienter
- Kommunikasjon vedrørende pasient journalføres, også i primærjournalsystemet til legesenteret
- Notifikasjon på forside om nye hendelser
- Visning av vedlegg lagret på pasient

## Dialogfunksjon

- Mulighet for å legge til nye behandlere i samtaler for tverrfaglige vurderinger
- Innhenting av skjema eller samtykker i forkant av timer
- Støtte for at enkelte beskjeder i chat er skjult for de parter som ikke skal ha innsyn i meldingen
- Helseboka har egen innebygd videokonsultasjon for sikre og krypterte samtaler
- Betalingsløsning for visning av beskjeder

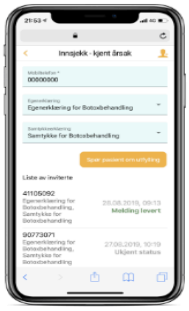


## Kalenderfunksjon og timebok

- Timebok med synkronisering til primærjournalsystem når det støttes (timebok kan deaktiveres ved manglende behov)
- Vanlige funksjoner for timeplukking, bestilling og timevisning klinikk
- Kalendervisning av kommende hendelser som videokonsultasjon eller andre gjøremål

## Forløpspakker

- Pasienter som skal ha en spesifikk behandling har gjerne et sett med hendelser som skal skje både før og etter selve pasientkontakten.
- Vi tilbyr klinikker å sette opp disse hendelsene slik at det kommer automatiske varsler til hver enkelt pasient om når de ulike hendelsene skal inntreffe.
- Dette vil vises i kalenderfunksjonen som neste hendelse og det vil også være en påminnelse om at nå er det på tide å utføre en handling.
- Eksempler på forløpspakker:
    - Spesifikke gjøremål (Fjerne bandasje, treningsøvelser, ta medisiner osv.)
    - Pre- eller postoperative hendelser (inklusive innhenting av informasjon)



## Innsjekking og samtykkefunksjoner

- Mulighet for å invitere pasienter til å levere fra seg helseinformasjon, samtykker og laste opp vedlegg
- Liste i systemet over de man har sendt forespørsel til og som ikke har svart
- Gjennom admin-side kan ulike partnere/klinikker legge til ulike skjema
- De kan selv definere om det kreves opplastning av bilder eller andre dokumenter
- Pasienten logger på med BankID og all informasjon er kryptert og sikker
- Meldinger kan sendes som kopi til fastlege, og fastlege kan også bes om fylle ut informasjon gjennom at de får en varsling pr SMS eller i journalen


## Betalingsløsninger

- Mulighet for betaling mellom
    - Pasient og helsepersonell
    - Helsepersonell og annet helsepersonell
- Meldinger kan låses for mottaker og kun vises etter betaling, f.eks. når fastlege besvarer e-konsultasjoner
- Integrerte omsetningsrapporter til regnskapet

## Appendix 2: financial statements of Helseboka AS

| Facts<br>Helseboka AS | |
|---|---|
| **Company name** (write in the box): | Helseboka AS |
| **Company structure:** | Akjeselskap (AS) |
| **Which national insurance contribution area applies for your company?** | Zone 4: 5,1 |
| **Is the company VAT-registered?** | Yes |
| **How long is the credit period for your customers?** | 0 days (ca |
| **How long is the credit period for your suppliers?** | 0 days (c |
| **Vacation pay rate:** | 12,0 % |

*Table 21: Facts about Helseboka AS*

**Capital requirement and financing during start-up**
**Helseboka AS**

**Capital requirements (The amount of capital needed during start-up) - all amounts need to be inclusive of VAT.**

| | |
|---|---|
| amount spent on accounting activities | 179 131 |
| office space at start-up (at cost price) | 100 000 |
| Marketing (advertising, brochures, sign, business cards and so on) | 100 000 |
| Wage cost during start-up | 1 915 405 |
| software Development costs | 7 164 184 |
| External advisory | 52 000 |
| Intellectual property rights | 18 000 |
| 10% backup (is calculated automatically) | 952 872 |
| Sum capital requirement | 10 481 592 |

**Financing (assets for the start-up):**

| | | | | |
|---|---|---|---|---|
| Equity - liquide assets from savings or co-owners. | | | | 520 000 |
| loan | Amortisation period (years): | | Rate of interest: | 10,0 % 200 000 |
| grant | | | | 2 000 000 |
| Other: Risk capital (informal investor, business angels or venture capital) | | | | 10 000 000 |
| Sum financing (will be the same as capital requirement): | | | | 12 720 000 |

| | |
|---|---|
| Checksum (Financing - Capital requirement) | 2 238 408 |

*Table 22: Capital requirements and financing during startup for Helseboka AS*

**Cash flow statement** — NB! All amounts in the table needs to be inclusive of VAT.
**Helseboka AS**

| Year => | Scroll => | | | | | | |
|---|---|---|---|---|---|---|---|
| Month => | Jan-20 | Apr-20 | Jul-20 | 0ct-20 | Jan-21 | Apr-21 | Jul-21 |
| **Paid-up share capital** | | | | | | | |
| **New loan** | | | | | | | |
| **Installation allowance (etablerer stipend)** | | | | | | | |
| **Alternativ capital in the company (subsidies)** | | | | | | | |
| **Alternativ capital in the company (risk capital)** | | | | | | | |
| **Payment from customers** | 0 | 0 | 44 990 | 202 530 | 302 013 | 434 938 | 543 828 |
| **Sum payment** | | 0 | 44 990 | 202 530 | 302 013 | 434 938 | 543 828 |
| **Business start-up expenses (incl.investments)** | 10 481 592 | | | | | | |
| **services related to sale** | 0 | 0 | 10 000 | 30 000 | 40 000 | 60 000 | 60 000 |
| **Wages and payroll tax** | 110 000 | 330 000 | 330 000 | 330 000 | 354 167 | 402 500 | 402 500 |
| **Employers' national insurance contributions** | 5 610 | 16 830 | 16 830 | 16 830 | 18 063 | 20 528 | 20 528 |
| **Vacation payments** | 0 | 0 | 158 400 | 0 | 0 | 0 | 193 200 |
| **Marketing** | 6 667 | 20 000 | 20 000 | 20 000 | 35 000 | 45 000 | 45 000 |
| **Rent** | 4 583 | 13 749 | 13 749 | 13 749 | 14 207 | 15 125 | 15 125 |
| **Other payments regarding management** | 2 353 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 |
| **Accounting** | 0 | 0 | 0 | 0 | 10 000 | 30 000 | 30 000 |
| **Research and developement costs** | 3 467 | 10 400 | 10 400 | 10 400 | 20 400 | 25 400 | 25 400 |
| **Insurance** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Interest costs - loan** | | | | | | | |
| **Part payment amount** | | | | | | | |
| **Lending rate for overdrafts** | | | | | | | |
| **Tax payment - corporation tax** | | | | | | | |
| **Sum payments** | 10 614 272 | 398 038 | 566 438 | 428 038 | 498 896 | 605 612 | 798 812 |
| | | | | | | | |
| **Sum - liquidity by start-up period** | 12 720 000 | 2 105 728 | 1 707 690 | 1 186 242 | 960 734 | 763 851 | 593 177 |
| **cash inflow in this period** | 0 | 0 | 44 990 | 202 530 | 302 013 | 434 938 | 543 828 |
| **Cash outflow in this period** | 10 614 272 | 398 038 | 566 438 | 428 038 | 498 896 | 605 612 | 798 812 |
| **Changes in this period** | -10 614 272 | -398 038 | -521 448 | -225 508 | -196 883 | -170 674 | -254 984 |
| **Sum - liquidity by the end of this period** | 2 105 728 | 1 707 690 | 1 186 242 | 960 734 | 763 851 | 593 177 | 338 193 |

| Oct-21 | Jan-22 | Apr-22 | Jul-22 | Oct-22 | Jan-23 | Apr-23 | Jul-23 | Oct-23 | Jan-24 | Apr-24 | Jul-24 | Oct-24 | Dec-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1 830 000 | 2 372 163 | 2 479 970 | 1 716 215 |
| 740 420 | 1 327 980 | 1 262 970 | 1 482 970 | 1 502 970 | 1 527 970 | 1 546 508 | 1 562 970 | 1 616 970 | 1 725 000 | 1 830 000 | 2 372 163 | 2 479 970 | 1 716 215 |
| 740 420 | 1 327 980 | 1 262 970 | 1 482 970 | 1 502 970 | 1 527 970 | 1 546 508 | 1 562 970 | 1 616 970 | 1 725 000 | | | | |
| 60 000 | 113 000 | 219 000 | 219 000 | 219 000 | 256 000 | 330 000 | 330 000 | 330 000 | 420 000 | 600 000 | 600 000 | 600 000 | 400 000 |
| 402 500 | 428 958 | 481 875 | 481 875 | 481 875 | 481 875 | 481 875 | 481 875 | 481 875 | 560 417 | 717 500 | 717 500 | 717 500 | 478 333 |
| 20 528 | 21 877 | 24 576 | 24 576 | 24 576 | 24 576 | 24 576 | 24 576 | 24 576 | 28 582 | 36 593 | 36 593 | 36 593 | 24 395 |
| 0 | 0 | 0 | 231 300 | 0 | 0 | 0 | 231 300 | 0 | 0 | 0 | 344 400 | 0 | 0 |
| 45 000 | 70 000 | 120 000 | 120 000 | 120 000 | 88 333 | 25 000 | 25 000 | 25 000 | 60 000 | 130 000 | 130 000 | 130 000 | 86 667 |
| 15 125 | 15 628 | 16 637 | 16 637 | 16 637 | 17 191 | 18 313 | 18 301 | 18 301 | 18 912 | 20 131 | 20 131 | 20 131 | 13 420 |
| 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 7 059 | 4 706 |
| 30000 | 72 500 | 93 750 | 93 750 | 93 750 | 102 083 | 118 750 | 118 750 | 118 750 | 118 750 | 118 750 | 118 750 | 118 750 | 79 167 |
| 25 400 | 45 400 | 55 400 | 55 400 | 55 400 | 38 734 | 30 400 | 30 400 | 30 400 | 28 600 | 55 400 | 55 400 | 55 400 | 36 934 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | |
| 605 612 | 774 422 | 1 018 297 | 1 249 597 | 1 018 297 | 1 015 851 | 1 035 973 | 1 267 261 | 1 035 961 | 1 242 320 | 1 685 433 | 2 029 833 | 1 685 433 | 1 123 622 |
| 338 193 | 473 001 | 1 026 559 | 1 271 232 | 1 504 605 | 1 989 278 | 2 501 397 | 3 011 932 | 3 307 641 | 3 888 650 | 4 371 330 | 4 515 897 | 4 858 227 | 5 652 764 |
| 740 420 | 1 327 980 | 1 262 970 | 1 482 970 | 1 502 970 | 1 527 970 | 1 546 508 | 1 562 970 | 1 616 970 | 1 725 000 | 1 830 000 | 2 372 163 | 2 479 970 | 1 716 215 |
| 605 612 | 774 422 | 1 018 297 | 1 249 597 | 1 018 297 | 1 015 851 | 1 035 973 | 1 267 261 | 1 035 961 | 1 242 320 | 1 685 433 | 2 029 833 | 1 685 433 | 1 123 622 |
| 134 808 | 553 558 | 244 673 | 233 373 | 484 673 | 512 119 | 510 535 | 295 709 | 581 009 | 482 680 | 144 567 | 342 330 | 794 537 | 592 593 |
| 473 001 | 1 026 559 | 1 271 232 | 1 504 605 | 1 989 278 | 2 501 397 | 3 011 932 | 3 307 641 | 3 888 650 | 4 371 330 | 4 515 897 | 4 858 227 | 5 652 764 | 6 245 357 |

*Table 23:Cash flow statements of 5 years for Helseboka AS*

| Revenue Forecast | Helseboka AS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| First month (Type month and year: *Jan. 2020*) => | Jan-20 | Feb-20 | Mar-20 | Apr-20 | May-20 | Scroll ==> Jun-20 | Jul-20 | Aug-20 | Sep-20 | Oct-20 | Nov-20 | Dec-20 | Sum 0 |
| *Revenue subject to VAT – service (App / Web-based)* | 0 | 0 | 0 | 0 | 0 | 0 | 44 990 | 59 650 | 69 890 | 72 990 | 80 233 | 110 890 | 438 643 |
| *Revenue exempt from VAT - service (App / Web-based)* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | 0 | 0 | 0 | 0 | 0 | 0 | 10 000 | 10 000 | 10 000 | 10 000 | 10 000 | 10 000 | 60 000 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 34 990 | 49 650 | 59 890 | 62 990 | 70 233 | 100 890 | 378 643 |
| *Revenue subject to VAT - products/service type 2* | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 2* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Revenue subject to VAT - products/service type 3* | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 3* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum VAT-registered revenue | 0 | 0 | 0 | 0 | 0 | 0 | 44 990 | 59 650 | 69 890 | 72 990 | 80 233 | 110 890 | 438 643 |
| Sum revenue exempt from VAT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of products and materials | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of services | 0 | 0 | 0 | 0 | 0 | 0 | 10 000 | 10 000 | 10 000 | 10 000 | 10 000 | 10 000 | 60 000 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 34 990 | 49 650 | 59 890 | 62 990 | 70 233 | 100 890 | 378 643 |

| Revenue Forecast | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| First month (Type month and year: *Jan. 2020*) => | Jan-21 | Feb-21 | Mar-21 | Apr-21 | May-21 | Jun-21 | Jul-21 | Aug-21 | Sep-21 | Oct-21 | Nov-21 | Dec-21 | Sum 1 |
| *Revenue subject to VAT – service (App / Web-based)* | 110 890 | 110 890 | 156 058 | 167 990 | 180 806 | 180 806 | 182 216 | 188 990 | 190 880 | 360 550 | 410 000 | 456 990 | 2 697 066 |
| *Revenue exempt from VAT - service (App / Web-based)* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 240 000 |
| Gross profit | 90 890 | 90 890 | 136 058 | 147 990 | 160 806 | 160 806 | 162 216 | 168 990 | 170 880 | 340 550 | 390 000 | 436 990 | 2 457 066 |
| *Revenue subject to VAT - products/service type 2* | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 2* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Revenue subject to VAT - products/service type 3* | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 3* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum VAT-registered revenue | 110 890 | 110 890 | 156 058 | 167 990 | 180 806 | 180 806 | 182 216 | 188 990 | 190 880 | 360 550 | 410 000 | 456 990 | 2 697 066 |
| Sum revenue exempt from VAT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of products and materials | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of services | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 20 000 | 240 000 |
| Gross profit | 90 890 | 90 890 | 136 058 | 147 990 | 160 806 | 160 806 | 162 216 | 168 990 | 170 880 | 340 550 | 390 000 | 436 990 | 2 457 066 |

**Revenue Forecast**

| First month (Type month and year: *Jan. 2020*) => | Jan-22 | Feb-22 | Mar-22 | Apr-22 | May-22 | Jun-22 | Jul-22 | Aug-22 | Sep-22 | Oct-22 | Nov-22 | Dec-22 | Sum 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Revenue subject to VAT – service (App / Web-based)* | 460 990 | 420 990 | 420 990 | 420 990 | 490 990 | 492 990 | 498 990 | 498 990 | 501 990 | 501 990 | 501 990 | 512 990 | 5 724 880 |
| *Revenue exempt from VAT - service (App / Web-based)* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 876 000 |
| Gross profit | 387 990 | 347 990 | 347 990 | 347 990 | 417 990 | 419 990 | 425 990 | 425 990 | 428 990 | 428 990 | 428 990 | 439 990 | 4 848 880 |
| | | | | | | | | | | | | | |
| *Revenue subject to VAT - products/service type 2* | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 2* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | |
| *Revenue subject to VAT - products/service type 3* | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 3* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | |
| Sum VAT-registered revenue | 460 990 | 420 990 | 420 990 | 420 990 | 490 990 | 492 990 | 498 990 | 498 990 | 501 990 | 501 990 | 501 990 | 512 990 | 5 724 880 |
| Sum revenue exempt from VAT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of products and materials | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of services | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 73 000 | 876 000 |
| Gross profit | 387 990 | 347 990 | 347 990 | 347 990 | 417 990 | 419 990 | 425 990 | 425 990 | 428 990 | 428 990 | 428 990 | 439 990 | 4 848 880 |

**Revenue Forecast**

| First month (Type month and year: *Jan. 2020*) => | Jan-23 | Feb-23 | Mar-23 | Apr-23 | May-23 | Jun-23 | Jul-23 | Aug-23 | Sep-23 | Oct-23 | Nov-23 | Dec-23 | Sum 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Revenue subject to VAT – service (App / Web-based)* | 512 990 | 512 990 | 512 990 | 520 528 | 520 990 | 520 990 | 520 990 | 538 990 | 538 990 | 538 990 | 575 000 | 575 000 | 6 389 438 |
| *Revenue exempt from VAT - service (App / Web-based)* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 1 320 000 |
| Gross profit | 402 990 | 402 990 | 402 990 | 410 528 | 410 990 | 410 990 | 410 990 | 428 990 | 428 990 | 428 990 | 465 000 | 465 000 | 5 069 438 |
| | | | | | | | | | | | | | |
| *Revenue subject to VAT - products/service type 2* | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 2* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | |
| *Revenue subject to VAT - products/service type 3* | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 3* | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | |
| Sum VAT-registered revenue | 512 990 | 512 990 | 512 990 | 520 528 | 520 990 | 520 990 | 520 990 | 538 990 | 538 990 | 538 990 | 575 000 | 575 000 | 6 389 438 |
| Sum revenue exempt from VAT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of products and materials | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of services | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 110 000 | 1 320 000 |
| Gross profit | 402 990 | 402 990 | 402 990 | 410 528 | 410 990 | 410 990 | 410 990 | 428 990 | 428 990 | 428 990 | 465 000 | 465 000 | 5 069 438 |

**Revenue Forecast**

| First month (Type month and year: *Jan. 2020*) => | Jan-24 | Feb-24 | Mar-24 | Apr-24 | May-24 | Jun-24 | Jul-24 | Aug-24 | Sep-24 | Oct-24 | Nov-24 | Dec-24 | Jan-25 | Sum 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Revenue subject to VAT – service (App / Web-based)* | 575 000 | 575 000 | 575 000 | 680 000 | 790 721 | 790 721 | 790 721 | 821 990 | 821 990 | 835 990 | 835 990 | 880 225 | 890 990 | 9 864 338 |
| *Revenue exempt from VAT - service (App / Web-based)* | | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 2 600 000 |
| Gross profit | 375 000 | 375 000 | 375 000 | 480 000 | 590 721 | 590 721 | 590 721 | 621 990 | 621 990 | 635 990 | 635 990 | 680 225 | 690 990 | 7 264 338 |
| | | | | | | | | | | | | | | |
| *Revenue subject to VAT - products/service type 2* | | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 2* | | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | |
| *Revenue subject to VAT - products/service type 3* | | | | | | | | | | | | | | 0 |
| *Revenue exempt from VAT - products/service type 3* | | | | | | | | | | | | | | 0 |
| Products and materials consumption related to sale | | | | | | | | | | | | | | 0 |
| Purchase of services related to sale | | | | | | | | | | | | | | 0 |
| Gross profit | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | |
| Sum VAT-registered revenue | 575 000 | 575 000 | 575 000 | 680 000 | 790 721 | | 790 721 | 821 990 | 821 990 | 835 990 | 835 990 | 880 225 | 890 990 | 9 073 617 |
| Sum revenue exempt from VAT | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of products and materials | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum - purchase of services | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 200 000 | 2 400 000 |
| Gross profit | 375 000 | 375 000 | 375 000 | 480 000 | 590 721 | | 590 721 | 621 990 | 621 990 | 635 990 | 635 990 | 680 225 | 690 990 | 6 673 617 |

*Table 24: Revenue forecast of 5 years for Helseboka AS*