Tampere University of Applied Sciences

Navigating the Adoption of Mobile Health Technology

Strategies for Seamless Market Integration in Finland

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ABSTRACT

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In the evolving healthcare landscape, mobile health technology has significantly transformed how healthcare services are delivered and accessed globally. Leveraging the widespread use of mobile phones and wireless technologies, professionals in healthcare, engineering, and research see the potential to revolutionize the industry. The urgent adoption of mobile health technology is crucial in addressing complex global healthcare challenges, including an ageing population, the prevalence of chronic diseases, and rising healthcare costs.

The thesis has been commissioned by Inlisol a young company looking to break into a quickly growing market. The author hopes to provide them with the tools they need to penetrate the market confidently and effectively with their product as a service.

The aim is to explore the historical adoption of mobile health technology, focusing on the current business environment in the Finnish health technology market. The research will conduct a thorough analysis to identify and propose effective strategies for the seamless integration of mobile health technology solutions into the Finnish healthcare and technology market. Research and landscaping of already successful Finnish healthcare companies will act as a benchmark as to how to find success. A PESTLE analysis is included to determine the external factors Inlisol will need to be aware of to increase chances of success.

Keywords: Benchmark, eHealth, Health Technology, mHealth, PESTLE

CONTENTS

GLOSSARY

IoT	Internet of Things; technological devices capable of communicating with one another.
eHealth	Healthcare services supported by digital services.
mHealth	Practice of healthcare supported by mobile devices.
Telemedicine	Healthcare delivered over the phone.

1 INTRODUCTION

In the ever-evolving landscape of healthcare, the transformative impact of mobile health technology is unmistakable. This technological innovation has not only revolutionised the delivery and accessibility of healthcare services but has also garnered widespread recognition from healthcare professionals, engineers, and researchers. Mobile phones and wireless technologies, ubiquitous and continually advancing, have become powerful tools in reshaping the healthcare industry. The imperative adoption of mobile health technology is increasingly acknowledged as essential in addressing the complex challenges faced by healthcare systems globally. These challenges include the demands posed by ageing populations, the rising prevalence of chronic diseases, and the escalating costs of healthcare.

The term **Mobile Health Technology** (mHealth) has gained prominence since the early 2000s, coinciding with the exponential growth and accessibility of mobile phones and the advent of diverse digital applications and internet connectivity. As healthcare providers strive to optimise patient care, enhance operational efficiencies, and empower individuals to actively participate in managing their health, mobile health technology has emerged as a promising solution.

Mobile healthcare's definition has changed numerous times since it was first introduced in the early 2000s. In Table 1, the definitions of Mobile health can be seen in chronological order over the last two decades.

Definitions of Mobile Health (m-Health)—A Chronological Perspective	Source
Mobile computing, medical sensor and communications technologies for healthcare.	Istepanian et al. (2003, 2004)
Using mobile communications—such as PDAs and mobile phones—for health services and information.	Vital Wave Consulting–United Nations/Vodafone Foundation (2009)
A subset of eHealth, using mobile devices to deliver health services to the patients.	Michael (2009)

Definitions of Mobile Health (m-Health)—A Chronological Perspective	Source
The delivery of healthcare services via mobile communication devices.	m-Health Summit Foundation for National Institute of Health (2009)
Medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices.	World Health Organization (2011)
The use of mobile computing and communication technologies in health care and public health is a rapidly expanding area within e-health.	Free et al. (2013)
The use of mobile wireless technologies for public health.	World Health Organization (2018)
The use of mobile and wireless technologies to support health objectives.	World Health Organization (2019)

FIGURE 1. mHealth definitions A chronological perspective. (Istepanian 2022).

The need for health technology arises from multiple factors that exert pressure on the healthcare industry. These include the challenges posed by ageing populations, the prevalence of chronic disease and the escalating cost of healthcare.

Successful integration of mHealth into the healthcare market requires careful navigation. This is due to the companies operating in this sector facing consistent innovation and the complexity of such a volatile market. Some of the technology integration difficulties into this sector can include financial strains, demand for data-driven insights, evolving regulatory and policy frameworks. Understanding and navigating the complexities associated with market integration, stakeholders in the mHealth industry can pave the way for a seamless adoption of new methods, products, and services. Leading to improved healthcare outcomes, enhanced patient experiences, and more sustainable healthcare systems.

There are several new niches that companies are focusing on in the industry. Niches surrounding specific disease or rehabilitation for chronic illnesses, resources for healthcare professionals in hospitals and care homes, information and education services for consumers and patients. Financial strains across the

industry, long exhausting hours causing nurses and doctors to find new vocations, demand for data driven insights by customers/patients, patient empowerment, technological advancements and regulatory and policy support from governments and local authorities.

The topic has been chosen to support Inlisol Inc, a growing health technology company operating out of Uusikaupunki, Finland. The objective of this thesis is to provide insight into already established and fast-growing companies and competitors in the immediate Finnish market. Understanding the success stories of these Finnish companies can be used as a stepping stone to make impactful business decisions in the future as well as help integrate new technology and ideas into the healthcare sector.

TABLE 1. Inlisol Ltd Company Information (InLiSol 2023 & Finder.fi 2023)

Founded	2021
Company ID (Y-tunnus)	3233739-6
Website	www.inlisol.com/
Company Type	Private limited company
Headquarters	Blasieholmanjaty 14b, 23500 Uusikaupunki, Finland
CEO	Aki Tapani Nummela
Personnel	2
	Fiscal period: 01/2022 – 12/2022
Revenue	EUR 1.00 million
Net income	EUR -89,000

To provide these insights the thesis will focus on case studies of successful Finnish businesses. These companies have been chosen through profitability, performance, and funding against a rapidly growing and competitive market. These cases will act as a benchmark for successful integration in the health technology market. The companies are Oura health, Nightingale Health, FirstBeat, Mendor, Noona Healthcare and Elisa digihoiva (Suvanto Care).

A PESTLE analysis has also been conducted on the Finnish health technology market to provide insight into external factors that will impact businesses within

this market. A “PESTLE analysis provides contextual information about business direction, its brand positioning, growth targets and risks.” (CIPD 2023). A PESTLE analysis will enable Inlisol to be prepared for the external factors that will affect its operations in Finland.

The outcome of this thesis will provide a basis to understanding the best practices within the health technology market with applied insight to how some of the largest health technology brands in the world have found success.

2 MARKET GROWTH OF MOBILE HEALTH TECHNOLOGY

The adoption of mHealth has revolutionised the healthcare industry by providing efficient and accessible solutions for both patients and healthcare providers. This chapter focuses on the market growth of mobile health technology, examining the global trends, the potential of mHealth apps, and the impact of mobile device usage in healthcare practices.

2.1 Evolution of Mobile Health Technology

The increasing capabilities of mobile devices, including their ability to run diverse applications and connect to the internet, have prompted healthcare professionals and researchers to implement IoTs (Internet of Things) in delivering healthcare services. IoT describes a network of interconnected physical devices, sensors, and objects that can collect and exchange data over the internet or other communication networks. These devices are equipped with embedded technology and can communicate with each other and humans, to facilitate data sharing, automation, and integration into various applications (Gillis 2023).

The internet revolutionised the global market as we know it today. Before internet communication was introduced. People relied on letters, in-person visitation and landline telephones which could be particularly inefficient. The internet, however, as well as 3/4G networks has allowed significant headway in terms of efficiency as well as the possibilities for remote patient care.

Today, the market has expanded to include a range of applications and devices that leverage the power of smartphones and wearable technology to consumers. Biometric trackers, such as heart rate monitors, oxygen level sensors and even blood pressure monitors, have become increasingly prevalent, empowering individuals to monitor their health in real time. This evolution has paved the way for the exponential growth of the mobile health technology market.

1905-1967 **Telemedicine**
Telemedicine, the application of healthcare provided for the patient without the need for in office visits. Most often via telephone or letters.
1973 **First mobile phones**
The first mobile telephone, the Motorola Dynatac was sold commercially. This granted access to phone calls and early messaging to be possible outside of the home or office. Dramatically improving communication speeds between healthcare providers and patients as they were no longer dependent on land-line connections or letters/email.
1978 **Telehealth**
Telehealth began with the use of digital information and communication technologies to access and manage health care services remotely. Telehealth encompasses telemedicine's goal of healthcare provision with the additional aspects of preventative, promotive and curative care delivery.
1993 **World Wide Web**
Developed by Tim Berners-Lee the goal of a "universal linked information system" became one of the most influential breakthroughs for Telehealth. Berners-Lee first established the world wide web in 1989. The ability to share, store and find information became available to the public in 1993. (Cern, 2023)
1999 **First uses of eHealth or electronic healthcare.**
The first uses of e-health; the term has had several definitions since 1999. The most cohesive definition today is: "E-health is the use of ICT to improve the ability to treat patients, facilitate behaviour change, and improve health" (Li, Su & Ji, 2019).
2000 **3G became available to common market**
The 3G era saw the Nokia 3310 and the Blackberry 6710 released with 3G capabilities allowing for interactive mobile data and real time emailing and text messageing services. This improved communication between healthcare providers and their patients.
2003 **– mHealth coined as a term in first publication.**
The first paper to invent and coin the term "mHealth" was published," Emerging mobile communication technologies for health: some imperative notes on health".

2004 **First dedicated mHealth paper** The first paper to define and introduce the concept of “mHealth” was published.
2006 **The first “mHealth” book was published, written by Istepanian.** mHealth: Emerging mobile health systems, served as a basis for understanding the future of m-health technologies and services. It also emphasised the impact of mobility health on existing mHealth and commercial telemedical systems.
2007 **First smartphones + First wireless fitness devices** The first iPhone amongst other smartphones were released. The ability to run applications on mobile devices significantly increased possibilities within the types of healthcare available through mobile devices. FitBit released their first wireless fitness devices that helped monitor the user’s health condition (Fz, 2021).
2012 **4G health** The concept of 4G-health introduced. In 2012, the USA adopted the 4G network. The same year Istepanaian & Zhang identified this newer networking technology as a key to m-health. The improved technology of 4G over it’s 3G counterpart allows for faster development and new possibilities to become available for service providers.
2014 **LTE-A and 4G mHealth era** LTE-A is an advanced 4G standard, which has improved connectivity speeds by double. From 150mbps to 300mbps. These speeds however are only theoretically possible under certain conditions. The actual speed increase was from 14mbps on LTE to 42 on LTE-A. (4G.co.uk, 30/09/2023).
2017 **First mHealth book depicting fundamentals and applications** The first mHealth book depicting the fundamentals and applications the concept has. (John Wiley & Sons March 2022)

2.2 Market Potential

The health care IT market (a group of all forms of eHealth) is set to grow at a CAGR (compound annual growth rate) 18.3% from 2023 to 2032. With the estimated value in 2022 of $200 billion USD (€185.4 billion EUR) set to reach as high as $1069 billion USD (€991.3 billion EUR).

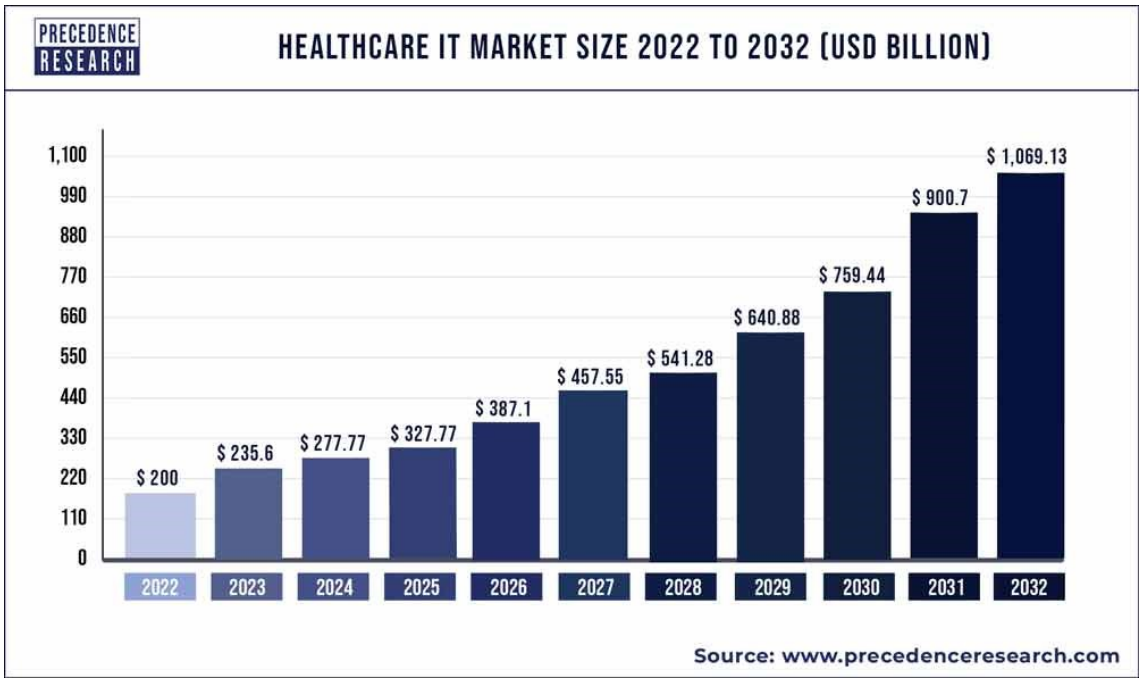

FIGURE 2. Healthcare IT market size in billions USD (Precedence Research, 2023)

The driving force of such rapid expansion is the demand for healthcare solutions to be better and more accessible, with focus on preventative rather than reactive care being a common trend.

2.3 Driving Growth Factors

The following subchapter outlines the reasons for growth in the healthcare industry overall. eHealth and mHealth will be beneficial to the healthcare industry as these factors cannot be provided for without the use of mHealth due to current healthcare practices already struggling with demand for services.

2.3.1 Ageing population, population, and workforce shortages

The average life expectancy of a human being in Europe is 80.1 years old (Bello 2023). Which is almost double what it was 100 years ago. At the beginning of the 19th century, the life expectancy of a European was around 33 years old. Nowhere had an expectancy past 40 years old (Li 2021, 247-248) hence In the last 100 years, we as a species have doubled our life expectancy with modern-day medicine, hygiene practices, and better health care infrastructure. With this increase, the demand for healthcare services has also increased exponentially. As we get older, we have more health complications such as dementia, cancer and other degenerative diseases that often occur once we reach the ages of 65.

Ageing population considers how many people are retired vs the working force. “Finland is one of the most rapidly ageing societies among OECD (Organisation for Economic Co-operation and Development) countries (Valkama & Oulasvirta 2021). According to Pirhonen et al. (2020), it is the fastest-ageing society in Europe. In 2000, 14.8% of the Finnish population was 65 and over, but in 2019, the share was 21.8%”. With this increase of 7% in 19years, it is unlikely that the workforce will not be able to accommodate this demographic in the same way we do now.

The current outlook of young people starting higher education seeing nursing jobs not as desirable as others. During the peak of the Covid-19 pandemic, 75% of nurses were considering switching professions according to the Finnish Nurses Association (YLE 2020). The same article goes onto say, In the spring of 2020, 8700 students applied for practical nurse training courses which was 3500 fewer than five years ago. This considerable decrease in nursing applicants highlights the strain on the healthcare industry as the population grows there will not be enough healthcare workers to meet demand.

2.3.2 Health consciousness

The increasing trend of heightened health consciousness within the population can be attributed to several interconnected factors. Education plays a pivotal role in shaping the public's perception of illness and ageing, alongside the influential impact of media consumption and the evolving life expectancy of the average person. The collective desire to lead prolonged and fulfilling lives serves as a driving force for the growing interest in maintaining fitness and overall well-being.

Advancements in healthcare communication have empowered individuals to better comprehend medical advice. Information packets provided to patients and the accessibility of online resources enable people to educate themselves about their illnesses, recovery processes, and proactive health measures. The internet, in particular, offers a vast repository of tips for coping with illnesses or navigating post-surgery recuperation.

The intersection of health and lifestyle has been significantly transformed by technological innovations, exemplified by the introduction of Fitbit in 2007 (Verizon, n,d). The market has since witnessed an inundation of diverse personal health trackers, wearable devices like watches and rings, as well as heart rate monitors—all conveniently portable. These technological tools empower individuals to monitor their vital signs and track fitness levels through various exercises and sports. The proliferation of mobile applications has further catalysed this trend, translating health data into easily understandable information for users, thereby fostering a culture of proactive health management.

2.3.3 Digitisation of Healthcare

The digitalization of healthcare emerges as a strategic response to the escalating demand for healthcare services. In tandem with the challenges posed by both burgeoning and ageing populations, the working demographic is grappling with the sustainable provision of care. Consequently, healthcare systems are strained, leading to diminished efficiency and resource allocation.

Digitalization presents an avenue for a more streamlined and cost-effective alternative, with a significant emphasis on preventative care. This entails initiatives such as educating individuals on adopting healthier lifestyles and recognizing the importance of adequate sleep. Moreover, the digitalization of healthcare facilitates a smoother, often abbreviated, waiting period - an aspect that can be pivotal in critical situations. Throughout the case studies examined in this thesis, we delve into the multifaceted potential unleashed by the digital transformation of the health sector.

3 HEALTH TECHNOLOGY IN FINLAND

Finland's health technology industry has experienced rapid growth over the past decade, positioning itself as a hub for innovation and advancements in healthcare. With constructive collaboration between patients, clinics, universities and research companies, coupled significant government and private investments and funding, Finland has established itself as a frontrunner in the development and implementation of health technologies. This chapter explores the factors contributing to the growth of the health technology industry in Finland as well as the opportunities and threats that it poses for mobile health technology companies in the market.

3.1 PESTEL Analysis

A Pestle analysis is a framework used to understand outside factors to the business. The Pestle is made up of political, economic, social, technological, legal, and environmental factors. This chapter will provide a Pestle analysis of the Finnish market. To best understand the implications a business may face when operating a Health-tech solution in the country.

3.1.1 Political Factors

Government support and funding

Finland is regularly ranked as one of the leaders when it comes to startups in a variety of international categories. As of February 2022, 3,821 startups call Finland their headquarters and together they are now worth €48.2b EUR in combined enterprise value. (Müller 2023). This is largely due to Finland's governmental standpoint on investment into startups and innovation. This is further endorsed by the production of skilled workforce by providing free education and university degrees for EU citizens.

Regulatory Framework

With healthcare frameworks rooted in the country's constitution, those residing in Finland are able to get access to essentially "free" healthcare, of which has been heavily subsidised by the government. Thus, allowing those of all financial brackets to access basic healthcare (Ministry of Social Affairs and Health 2023).

Digital health initiatives

Health initiatives are particularly useful in free health care operating countries. Finland's healthcare is municipality run and funded mostly by the government with excess charges falling on the patient. The reason these initiatives are often successful is that once a solution/service or product is adopted in one municipality it will likely move across the country selling more units or renditions of the solution.

Public health policies

These policies often drive the demand for health technology solutions. As they are often directed at preventative care and improving the health care systems. Preventative care has been recognised as a far more efficient and beneficial way of keeping people safe and out of hospital.

Navigating regulations

The health technology market proves challenging due to its dynamic nature stemming from new adaptations and possibilities. The realm of technology laws constantly evolves especially in Artificial Intelligence (AI). AI's uniqueness makes it particularly intricate to regulate, and consequently, regulations are subject to continuous revision. This can complicate the establishment of credibility and feasibility in real-world applications, often rendering much of the implementation theoretical. However, as we move forward AI regulations will become more set and understood. These regulations can also be seen as useful as companies can produce safe AI that abide regulation.

Reimbursement policies

Usually for healthcare products and machines the government or insurance company will reimburse a facility. Thus, allowing for the best machinery, and medication to be used to treat patients. It therefore vitally important to establish a connection with the insurance companies and administrators within the municipality.

Political instability and policy change

Elections often come with policy changes. This is especially apparent when there is a large shift in the political views from left to right which was a change Finland saw in the previous 2023 election in April. Kokoomus, or the NCP (National Coalition Party) with their partners the far-right Finns party. This shift may prove very different from the leftist parties previously in government. With new ideologies and an importance on regrowing the economy to prevent detrimental recession as a resultant of the Covid-19 pandemic. This however comes at the cost of many areas the left were investing in.

The NCP is looking to find around €4billion EUR to reduce the debt Finland has accumulated - with the majority of that being found through taxation. Most notably the VAT increase on items costing 10% with now costing 15% this hits medicines and healthcare, recreational activities such as going to the cinema, partaking in sports, or booking a hotel room. However, most of the saving is coming from the €1.5billion EUR cuts to social security by rejigging how regional healthcare systems are funded from the central government to generate efficient savings. (Mac Dougall 2023).

3.1.2 Economic Factors

Market growth and demand

As people age it become increasingly likely they are diagnosed with a serious illness. Healthcare is something that at some point every human on the planet will need to access. Whether it's for surgery, routine checkups, emergency room visits or end of life care. There is always demand for hospitals and healthcare. Finland suffers immensely from Alzheimer's Disease (AD) per capita.

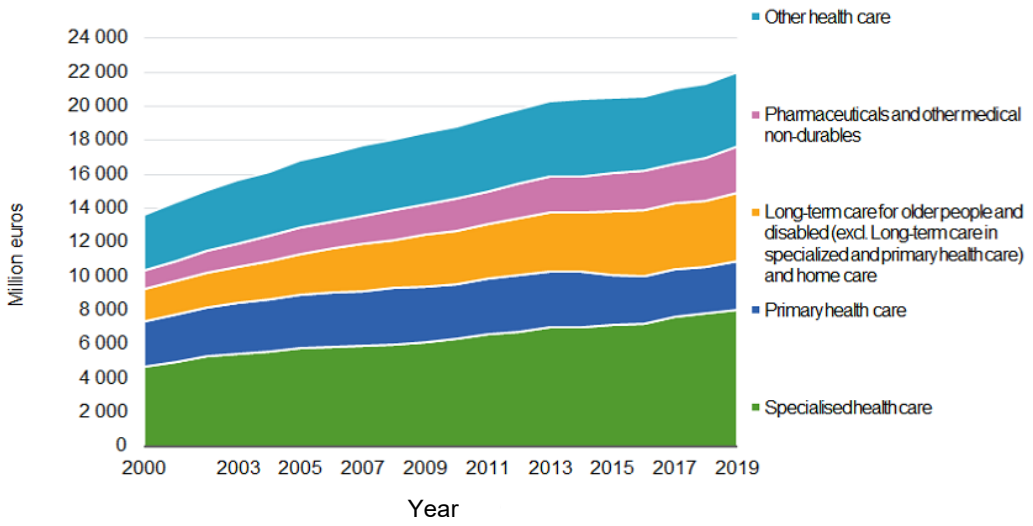

FIGURE 3. Healthcare expenditure in Finland (THL Terveydenhuollon menot ja rahoitus 2019).

The graph outlines the Finnish health care systems expenditure. In 2019 the expenditure on long term care for older people increased by 3.5% from the year prior, amounting to €2.5 billion EURs.

Due to increased demand for care homes this number will rise laterally as the population grows, costing the government billions. However, health-technology is looking to change that with some companies opting to develop home monitoring and wellbeing solutions.

Investment and funding

Investment into research and development key to continuous improvement and research and development of a service/product/solution. When seeking investment and funding, health tech companies are required to develop a clear and compelling pitch that outlines the unique value proposition of their solution, its potential impact on healthcare, the market opportunity, the strength of the team, and a detailed plan for the use of funds. It is also beneficial to approach investors or funding sources with a connection to the healthcare sector, as they can better understand the specific challenges and opportunities in the industry.

Job creation

The diverse nature of health tech means that it can create job opportunities across a wide range of skill sets, from technical roles to those requiring healthcare expertise and business acumen. As the health tech sector continues to grow and innovate, the potential for job creation remains substantial. Depending on the technology there will be a shift in where there are job opportunities. Often with automation, jobs are moved elsewhere as machines replace humans. For example, in the case of assisted living nurses will visit a patient's house daily or a couple of times a week providing support and medical aid. Some companies such as Inlsiol, are looking to remove the need for nurses to provide at home visits as often. This allows them to be more available in hospitals. This would not aid the demand of nurses, but also reduce travel. Furthermore, this helps reduce the burden on nurses already at the hospital as there are more staff available.

Affordability and budget constraints

Due to the current recession and the likely cuts to healthcare by the Finnish government. Health-Tech companies' products/services may be too expensive to produce and use. Magnetic Resonance Imaging (MRI) machines are commonly in use today as they provide non-invasive medical scans capturing almost every internal structure within the body. These machines cost around €1million EUR each with the most expensive one in existence costing $270million USD (€250million EUR) (Buntz 2014). These machines would be extremely costly for every hospital or clinic to have one on-site especially in small municipalities and towns further north in Finland where there are typically smaller populations and therefore being used less often. With this in mind budget constraints need to be taken into consideration.

Pricing and reimbursement pressures

Reimbursement is typically how hospitals rely on paying for their purchases. This means that there are many people involved with the purchase of larger items such as machinery. How much a healthcare sector is willing or is allowed to pay for a product or service may need to be taken into consideration. If your product adds value to existing processes or creates a better new process – but it is too expensive, the hospital would question purchasing the technology in fear of not being reimbursed.

Currency fluctuations

Currency fluctuations affect businesses in their own purchasing power. A business will lose the majority of its purchasing power if their operating currency were to inflate. This is a knock-on effect from the import and export of goods. If your countries exports are being bought at a high price and your import costs are low, your currency is stronger having a positive influence on purchasing power. These fluctuations can be driven by several things such as natural disasters, hyperinflation, or product regulation. These all contribute to the price of goods (Segal 2021).

Healthcare financial models

Depending on a customer's whereabouts, financial models for healthcare look very different. Healthcare in Europe is often heavily subsidised by the government as well as private insurance sometimes offered by the patient's employer. However, this isn't the case in other continents such as the Americas. Americans heavily rely on their insurance or company healthcare policy to cover the cost of healthcare. This means some healthcare options and services are overlooked such as preventative care which often costs a patient a little at the time but prevents serious illness which costs substantially more in the future.

3.1.3 Social Factors

Ageing population and chronic disease

A shift in the country's distribution of elderly people. This is reflected in the mean and median of a populations age. With a decline in birth rates fewer young people are growing into the workforce. "Fertility has fallen from an average of 5 births per woman in 1950 to 2.3 births per woman in 2021" (UNPF). Despite this, modern medicine and lifestyles are allowing us to live significantly longer lives with other factors such as average age of fire time mothers increasing exponentially.

Living longer has also led to the likelihood of being diagnosed with a chronic disease. Diseases such as diabetes, cardiovascular diseases, and neurodegenerative disorders, have risen (Ansah & Chiu 2023). Chronic diseases require continuous management and care, often involving multiple healthcare providers and interventions. Health tech can address these challenges:

Prevention and Management

Health tech solutions can focus on preventive measures, lifestyle modifications, and better management of chronic diseases through remote monitoring, medication reminders, and personalised treatment plans.

Early Detection

Technologies like wearable devices and health apps can aid in the early detection of health issues, allowing for timely interventions and potentially reducing the severity of chronic conditions.

Data-Driven Care

Data collected from health tech solutions can provide insights into disease progression, treatment effectiveness, and the impact of lifestyle changes, facilitating personalised care plans.

Patient empowerment and engagement

Patient empowerment can make a huge difference with recovery speed and beating the odds. Feeling as if you can take control of your illness or condition has the effects of: Ability to report symptoms and errors, improve patient safety, improve satisfaction in patients. “Empowerment in patients with chronic diseases has shown several positive effects, such as increased patient satisfaction with care, improved patient adherence to self-management of the treatment and better clinical outcomes” (Lorig & Holman, 2003)

Changing behaviour and lifestyle

Changing behaviour or lifestyle to receive a different result is usually a healthy way to live. For example, if a person who is overweight begins a meal plan and increase their daily exercise, they will be able to reduce their weight which was previously hazardous to their health. Obesity increases the likelihood of disease (CVD) and diabetes but also forms of cancer and chronic illness (Pi-Sunyer, 2009).

Lifestyle and behavioural changes usually lead to more than the original goal. For example, exercise leads to better sleep and mental health (Lewis 2023). This alongside weight loss and muscle gain will increase confidence which all feed into each other (Veiseh n.d). Positive behavioural changes can therefore be seen as a preventative healthcare as you are less likely to develop illness.

Increase health awareness.

Similar to empowerment, engagement and educating patients as well as those around them have many positive effects. Patients with chronic diseases need to understand their condition and so do their carers and family. If they understand the difficulties of living with the condition, they are more likely to provide better care for the patient due to their own understanding and empathy towards the patient.

Technology adoption barriers

Already having gone through medical school, doctors, and nurses that graduated or trained decades ago will be unfamiliar with newer technology which creates a learning curve slowing down their own work. Much like in most jobs, when a new system comes in time has to be spent training employees to use the system.

Privacy and Data security concerns

A prevalent problem in the technology industry is the security that is offered to its users. Data leaks of any kind can be harmful, but healthcare information is highly sought after. It is important that a company complies with regulations to protect its customers.

Healthcare disparities and inequalities

Disparities in healthcare often feel unfair. An example of this is cost of healthcare, better healthcare options are available to those with more money or in some cases better insurance. “[In 2015] About 0.5% of all air travellers entering the United States annually—between 100,000 and 200,000 people—list health treatment as a reason for visiting (this data excludes travellers from Canada and Mexico, the majority of whom travel to the United States overland)” (Salisu, Akanni & Vo 2021). Assuming these people are travelling for specific treatments or better types of care we know that poorer patients cannot afford this and therefore it causes disparity and inequality in types of healthcare.

Ethical and social implications

There are a number of ethical implications when it comes to technology entering the healthcare market. The use of bias data causes misinformation, the technology not working as intended or providing false information/false positives. Exploitation of patients must be avoided to succeed.

3.1.4 Technological Factors

Advancement in digital health technologies

Continuous advancements in technology allows for increased ease, longevity, and productivity amongst many industries. Integration of technology and advancements made in other fields allows for a combination of better services and products. In the case of health technology, advancements elsewhere can often be used to better the existing practices of healthcare professionals and the services they provide. For example, Nightingale health utilise biomarkers in blood to quickly determine possible illness before symptoms occur. This technology is widely available now, but prior to this, blood testing was a time-consuming process and is realistically only available to patients that are already showing symptoms.

Interoperability and integration

Integration of technology is an advancement made in one field/market that Is then adapted to be used in alternate markets and fields to better their efficiency. Technological integration is a common practice and allows for continuous development.

Moreover, interoperability is “the ability of different systems, devices, applications or products to connect and communicate in a coordinated way, without effort from the end user.” (Lewis 2019). An example of this would be cloud services and home assistants.

Data analytics and artificial intelligence

AI is imperative to success in the modern world. By utilising AI companies can assign tasks previously thought as overly difficult or time consuming to human labour to their AI counterparts. In doing so results and accuracy of the tasks are more reliable. These tasks may include analysing large quantities of data to find consistencies and trends.

Mobile and connected health solutions

Package solutions are becoming more feasible when it comes to health care as AI technology advances. Previous tasks such as data collection or analysis of every customer who has purchased product/solution is no longer an impossible task. The scale of an operation that delivers holistic insights into a customer's healthcare would be too expensive to run without the help of AI.

Solutions look to achieve total satisfaction without the need to buy another company's product or service where the original is lacking. Hence the solutions in the healthcare industry are becoming more popular.

Rapid technological obsolescence

Machinery used for healthcare purpose will continue to improve indefinitely. Highly specialised equipment can cost thousands of euros, so equipping hospitals and healthcare practices with the latest technology is not feasible. Overall, as technology becomes outdated it needs replacing with the latest most efficient version. Some technology will become obsolete when treating patients as new methods come to light rendering equipment near useless.

Technical challenges and implementation barriers

It is worth mentioning but some equipment requires particular conditions which some practices cannot accommodate for. For example, hospitals are usually considered some of the most power-hungry facilities in the country having to maintain lighting, ventilation, and temperature throughout the building as well as many pieces of equipment without faulting. If a company were to produce an amazing piece of equipment that consumes large quantities of power, it may be a deterrent for facilities as it puts risks in other areas of their immediate operation.

Data privacy and security risks

Customers' data is highly sought after in all regards, whether it is for marketing purposes or malicious use. The health sector experience some of the most expensive data leaks often costing millions of euros to rectify. Health data is "harder to protect, it's more complicated to detect an incident, and it's more expensive to implement compliance measures after the fact," Bertolini said during an interview with HealthITSecurity (McKeon 2023).

The blockchain is becoming a likely practice used to protect data these leaks may prove much easier to manage as well as there being less leaks overall. However, as of current they are rarely used or trusted to work effectively. There has however been widespread enthusiasm surrounding their usefulness when transferring data between trusted parties especially in a healthcare setting.

Costs of infrastructure

The costs of setting up equipment. For example, if a new section or extension to a facility needs to be added to host new equipment this becomes an incurred cost to the hospital. This only needs to be thought about if machines are particularly large or need to be kept separate from other parts of the health practice, they are housed in. Lack of sales is unlikely to be due to incurred costs to infrastructure.

3.1.5 Legal Factors

Privacy and Data Security Act

Privacy and data security are paramount considerations. These concerns are rooted in the extent to which individuals within a population are willing to divulge personal information. The value of consumer information is substantial to numerous companies, often translating into profitable ventures.

In the realm of health technology, the value of health records amplifies considerably for both legitimate companies and the black market. Breaching hospital records can severely jeopardise patients' lives and careers. A noteworthy trend emerged during the COVID-19 pandemic, marked by an uptick in people sharing substantial portions of their DNA through at-home testing kits for genealogy purposes. However, privacy concerns persisted. Family Tree DNA, specialising in

at-home kits and genealogy research, was found to have been privately sharing customer information with the FBI, underscoring the intricate interplay between personal data, technology, and government agencies. (Haag 2019).

3.1.6 Environmental Factors

Remote monitoring and telehealth

Remote monitoring prevents travelling to and from hospital and healthcare facilities, it also means less waste is produced by these facilities. Delivering healthcare to someone remotely often leads to a smaller carbon footprint. There is also less chance that the person will be in better health if they do not have to visit hospitals where they can contract an illness. This is especially true for elderly people and sufferers of immune deficiencies.

Carbon cost and carbon footprint

Carbon footprint in terms of the amount of CO2 and greenhouse gas emissions that are produced when the device is manufactured and transported to the final destination is something to consider. Overall, you want this to be low per product to avoid extra costs imposed by legislation. It can also prove important as investors would often like to know the carbon cost per unit produced. This gives investors a slight understanding of the supply chain as well as the sustainability of the process.

Tech waste takes time to recycle due to its intricacies. Making a product that lasts a long time is important when considering its use case.

4 MOBILE HEALTH TECHNOLOGY BUSINESSES IN FINLAND

Finland in recent years has been an innovation incubator for new companies in the mHealth industry. This chapter will include benchmarking of successful companies within the health technology market to give insight into how they have found success.

4.1 Oura Health Ltd: Founded 2013

Oura Health is recognised for its product, the Oura Ring, used to track the users' health and wellness metrics. The company was founded in 2013 by Petteri Lahtela (former CEO), Kari Kivelä, and Markku Koskela and is headquartered in Oulu, Finland with additional locations in Helsinki, and San Francisco, United States.

TABLE 2. Oura Health Company Information (Oura Health Oy, 2023 & Finder.fi, 2023)

Founded	2013
Company ID (Y-tunnus)	2542776-4
Website	www.ouraring.com
Company Type	Private limited company
Headquarters	Elektroniikkatie 10, 90590 Oulu, Finland
CEO	Thomas Edward George Hale (since 2022)
Personnel	249 (2022/09)
	Fiscal period: 01/2022 – 09/2022
Revenue	EUR 83.40 million
Net income	EUR 56.90 million

Oura is a prominent health technology company. It has garnered widespread recognition for its revolutionary product, the Oura ring. As a wearable health tracking device, the Oura ring is specifically designed to focus on sleep and activity monitoring. By seamlessly collecting data on wearers' sleep patterns, heart rate, temperature and more, the ring provides valuable insights into users' overall well-being and health. Oura health's success can be attributed to their innovative product and their focus on sleep.

Their mission statement is: To make health a daily practice.

Sleeping well is incredibly important and has been linked to prolonged life. Good sleep and a healthy circadian rhythm can massively reduce the risk of health conditions such as heart disease and diabetes. It also allows us to concentrate more and achieve much higher aspirational goals.

Oura's focus on sleep comes across in the 3 grades: Sleep, readiness, and activity. Your score is an indicator of "how your body feels and what your body needs, every second of every day". From indicating potential illness onset to determining optimal times for rest and exertion, these scores empower users to make informed decisions about their wellbeing throughout the day. From indicating potential illness onset to determining optimal times for rest and exertion, these scores empower users to make informed decisions about their well-being throughout the day.

Oura's products have been scientifically validated several times by researchers and specialists with feedback being shown on their website validating the importance of Oura's work (Oura 2023). This is especially important as it proves the product is safe and effective in what it promises. Oura takes pride in their continual efforts to validate their product and has extracts and quotes from doctors and professors to extend their credibility to potential customers on their website. Including reasons for how their product is so highly accurate in comparison to their competitors stating "Oura ring measures from the palm side of your finger [where the pulse is stronger to read from] - much stronger than your wrist" this statement knocks sports watches due to their inaccuracy in comparison. Oura also goes on

to state “Doctors measure your heart rate from your finger for a reason”. Further implying the possible accuracy over alternatives.

FIGURE 4. Oura ring (Oura Health Oy, 2023).

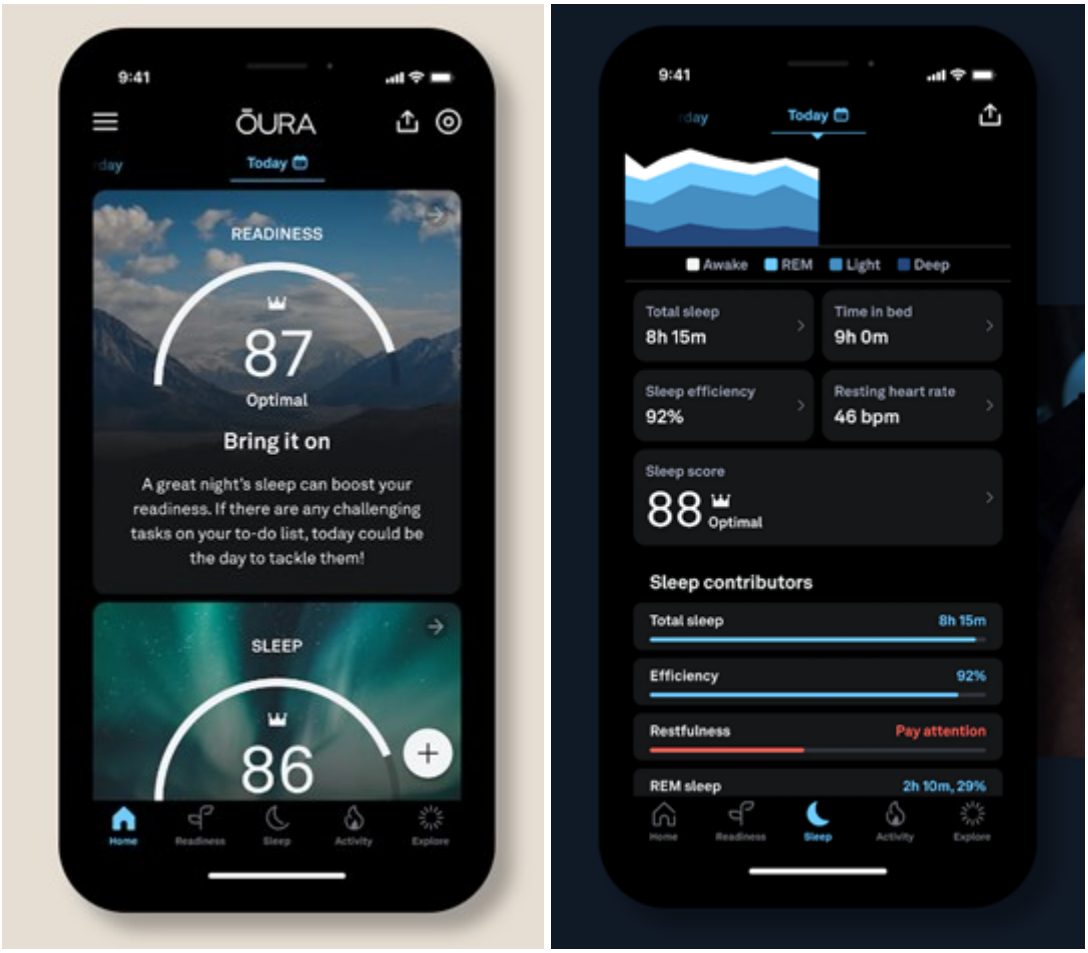

FIGURE 5. Oura app (Oura Health Oy, 2023).

Oura health has undoubtably found success with their solution to better their consumers health. Below are a few key points in areas they have produced favourable traction and created their success.

Focus on Sleep and Health Monitoring

Oura distinguished itself by prioritizing sleep health and providing users with comprehensive insights into their well-being. The company recognized the importance of sleep and its impacts on health and designed its wearable technology to focus on sleep monitoring, heart rate tracking, temperature measurement, and activity monitoring. Monitoring these to give the wearer an understanding of their sleep patterns in detail.

Innovative Product

The Oura ring stood out as an innovative wearable health tracking device that captured various physiological data in a non-intrusive manner. Its discreet and stylish design appealed to a wide range of users, making it a popular choice in the wearable technology market.

Scientific Validation

Oura's products underwent scientific validation by researchers and specialists, which helped build credibility and trust among customers. The validation process demonstrated the accuracy and reliability of the data collected by the Oura ring, providing reassurance to users about the effectiveness of the product.

Customer-Centric Approach

Oura cultivated a strong community of users through regular engagement, feedback collection, and continuous updates to their application and product features. This customer-centric approach allowed the company to address user needs and preferences effectively, leading to higher customer satisfaction and loyalty.

Niche Market

Oura focused on a specific niche market - individuals seeking to optimise their sleep and overall well-being. By specialising in sleep monitoring and health insights, Oura carved a distinct position in the health technology industry, attracting users who prioritised health and sleep quality.

Endorsements and Credibility

Oura leveraged endorsements from medical professionals and professors, highlighting the scientific foundation of their product. This enhanced the company's credibility and reassured potential customers about the product's effectiveness and safety.

Business Partnerships

The company established strategic partnerships with healthcare providers, research institutions, and universities, which allowed them to access a wider audience and tap into additional resources for research and development.

Market Awareness and Education

Oura actively engaged in educating consumers about the importance of sleep and how its technology positively impacts their well-being. Raising awareness about the connection between sleep and overall health helped create a demand for their products.

4.2 Nightingale Health Ltd: Founded 2002

Nightingale Health produces a blood work solution that highlights biometric markers in a patient's blood to detect diseases before symptoms arise. This testing has been around since 2013. The company was founded in 2002 by Teemu Pentti Suna (current CEO), Antti Kangas (Current CTO), Pasi Soininen, PhD (Laboratory Director) and Peter Würtz, PhD (Scientific Director). The company headquarters is in Helsinki, Finland.

TABLE 3. Nightingale Health Company Information (Nightingale Health Oyj, 2023 & Finder.fi, 2023)

Founded	2002
Company ID (Y-tunnus)	1750524-0
Website	www.nightingalehealth.com
Company Type	Public limited company
Stock Symbol	HEL: HEALTH
Headquarters	Mannerheimintie 164 A, 00300 Helsinki, Finland
CEO	Teemu Pentti Suna (since 2014)
Personnel	64 (2022 avg.)
	Fiscal period: 07/2022 – 12/2022
Revenue	EUR 2.24 million
Net income	EUR -8.55 million

Nightingale Health produces two forms of blood work solutions, those that are used in hospitals for routine checks and those that are more consumer/customer based. Nightingales' Livit solution is usually bought by individuals or sold to businesses as part of their employment health care.

Nightingale Health's mission statement is the following: to enable preventative health by identifying individuals with health risks and connecting them with healthcare providers guiding medical interventions.

Users can gain health insights after having blood drawn via Nightingale Healths app and service kit. The platform also offers health recommendations based on this information. Nightingale has produced a mobile app that offers holistic health insights via biomarkers in the patient's blood. The holistic insights allow users to better understand their health, the app suggests changes to lifestyle to better suit your body.

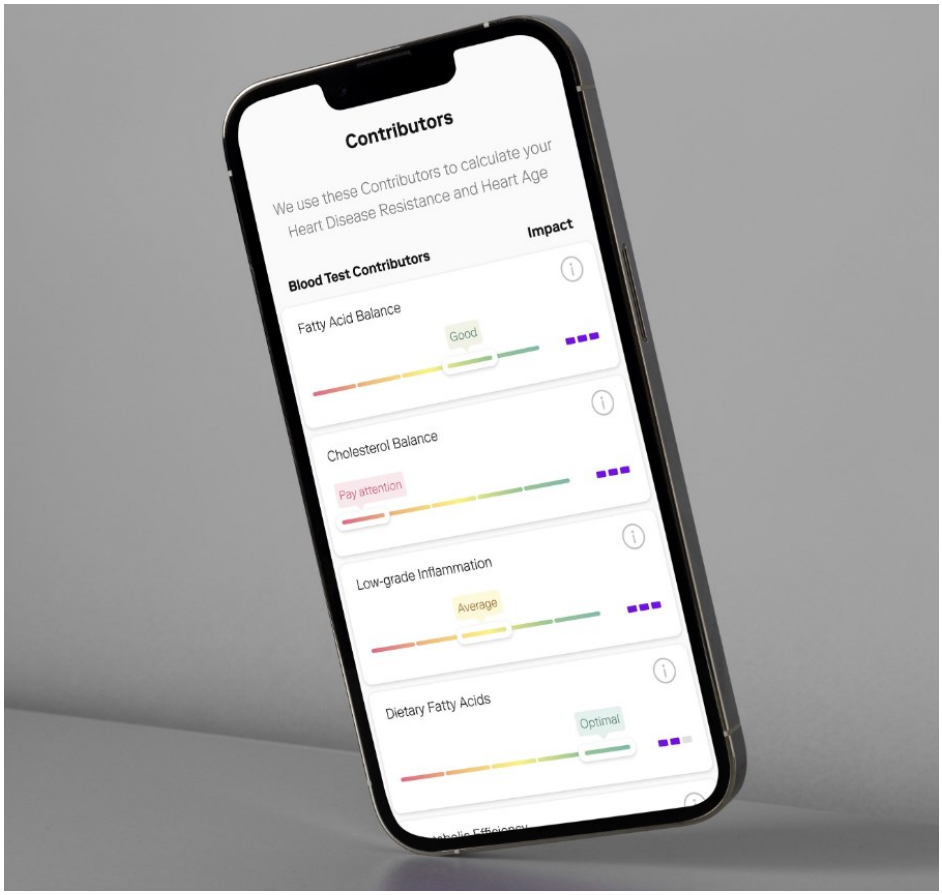

FIGURE 6. Nightingale health app (Nightingale Health 2023)

The app insights provide information on the user's current cardiovascular health, metabolic disorders, inflammation, and liver function. Most importantly this data allows for health risks to be detected early and therefore can be avoided or treated early. This can be incredibly useful in detecting very early signs of serious illnesses such as cancer or diabetes. The app breaks down your body into scores in 4 categories: heart, metabolism, mind, and immunity. By focusing on these 4 areas, you can add what the app calls healthy years onto your life expectancy indicating you are physically capable and healthy (Nightingale health, 2023).

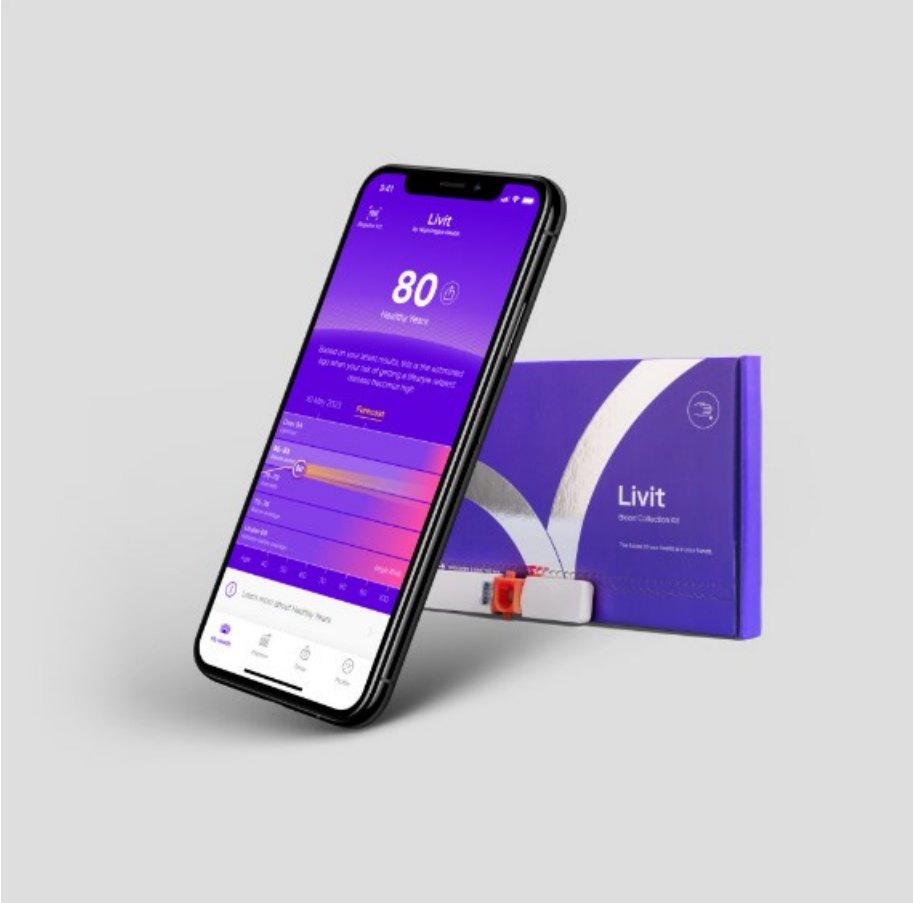

FIGURE 7. Nightingale "Livit" package (Nightingale health, 2023)

Due to Nightingales' solution being easy to access as well as giving a more holistic approach to blood testing they have found much success. The following are points in their success:

Innovative biomarking solution:

Nightingale Health aim to sell this product to the public healthcare sector. However, they also understand that there are other healthcare sectors who would also find benefit and therefore marketed towards the private sector too as well as research. They have also produced their “Livit” solution that comes in 3 components. Doctors and other healthcare professionals can use them in healthcare facilities, businesses can buy them for their employees as a healthcare benefit and they can be purchased individually by the public. These tests specialise in early detection utilising biomarkers that live in our cells by monitoring them we can detect what is happening at a given moment.

Focused on blood and utilising biomarkers:

Nightingale Health have set their focus on early detection of diseases. Allowing for the detection of these diseases on a wider scale. Previously, early diagnosis was down to chance. Diseases like cancer might be diagnosed early if the patient is seeking care for another health issue, but this is not always the case. Nightingale Health have produced three avenues in which an early diagnosis may arise.

Helps doctors/nurses’ and streamlines research:

Nightingale Health directs their service towards public and private healthcare facilities to increase efficient practices. This will allow for early diagnosis of disease which could help prevent difficult prognoses and long treatment plans.

From reactive to preventative care:

It is easier to prevent disease by making lifestyle changes than treat dangerous and debilitating diseases. Currently a person would seek help if they had a problem, it is unlikely they could medically treat themselves. For example, if a patient is experiencing symptoms of diabetes such as dry skin, blurry vision, fatigue and feeling tingling sensations in their hands and feet. They might seek out their GP or go to the hospital. If a quick test issued through the Livit package that Nightingale Health offers was provided months prior this could massively reduce the detriment the disease could have due to an early diagnosis.

App:

The app allows for easy consumerism. With the holistic approach the app is easy to understand. As the Livit option of nightingale's service gains traction the app will become very important as a way of keeping the users engaged. It looks almost like a game with its intuitive user experience (UX) design notable in the way it displays statistics. This subsequently leads to appeal for future generations. The app has an inbuilt subscription for the testing kits which order themselves every 6 months or when desired.

Collaboration and credibility: Collaboration has been the success to Nightingale Health's credibility. The desire for the company is to be used by medical professionals in hospitals as well as be a form of health care provided to users directly in their homes. Research utilising Nightingales' solution is also highly sought after. The company recognises their technology is highly efficient in monitoring biomarkers and therefore is superior to other methods utilised in detection of diseases via alternatives such regular blood tests. "Our research service provides the only platform for comprehensive metabolic profiling for whole cohorts. Nightingale Health's technology is the only omics technology that has been measured across all 500,000 participants in the UK Biobank and 200,000 participants in the Estonian Biobank." (Nightingale Health, 2023) Alongside this statement the website hosts 14 different selected testimonials from specialists in varying fields. (Nightingale Health, 2023).

4.3 Firstbeat Ltd: Founded 2002

Firstbeat provide physiological analytics to millions of athletes globally. (Firstbeat, 24/09/2023) . The company was founded in 2002 by Aki Pulkkinen (current Manageing Director) and Joni Kettunen (current Chairman) (Crunchbase, 2023). The company headquarters are in Jyväskyla, Finland.

TABLE 4. Firstbeat Company Information (Firstbeat Ltd 2023 & Finder.fi, 2023)

Founded	2002
Company ID (Y-tunnus)	1782772-5
Website	www.firstbeat.com
Company Type	Private limited company
Headquarters	Yliopistonkatu 28 A, 2nd floor, 40100 Jyväskylä, Finland
CEO	Joni Olli Antero Kettunen (2023)
Personnel	58
	Fiscal period: 01/2022 – 12/2022
Revenue	EUR 3.80million
Net income	EUR -3.00 million

The company has developed software and analytic solutions for physiological data analysis. Their solutions focus on heart rate monitoring and provides data on stress levels, optimal recovery times and the amount of sleep the user needs. Firstbeats' focus is to utilise heart rate variability (HRV) to translate human physiology into a mathematic formula that would allow for a better understanding of fitness. The use of HRV allowed for the development of Firstbeats software. Firstbeats' edge comes from their HRV technology as well as their comprehensive support packages that allow for improvement in all aspects of the athlete's performance. Today more than a thousand professional sports teams, millions of consumers, and employees in over 70 countries use Firstbeat analytics.

First Beats's mission statement is: to use physiology and science to unlock human potential in health, performance and productivity.

Firstbeat look to optimise the following aspects of athletic performance across their packages:

- **Training plans** – Identify balance in training and when it's time to train.
- **Team Training** – Monitor load to identify individual responses.
- **Game Day optimisation** – Controlled executions of training loads and drills in pre-game practices.
- **Injury risk management** – identify early signs of anomalies in accumulated load and recovery.
- **Return to play** – increase load progressively during return to play process.
- **On & off-season training** – Guidance to properly training, building tolerant, strong and resilient athletes.
- **Recovery & resilience** – Making athletes more robust, and to quickly recover.
- **Sleep and wellbeing** – educating athletes on sleep and how to take care of themselves.
  (FirstBeat Offerings, 02/12/2023)

Due to the understanding of HRV Firstbeats' technology allows for a holistic approach which works exceptionally well when working with athletes who are often willing to take the feedback onboard.

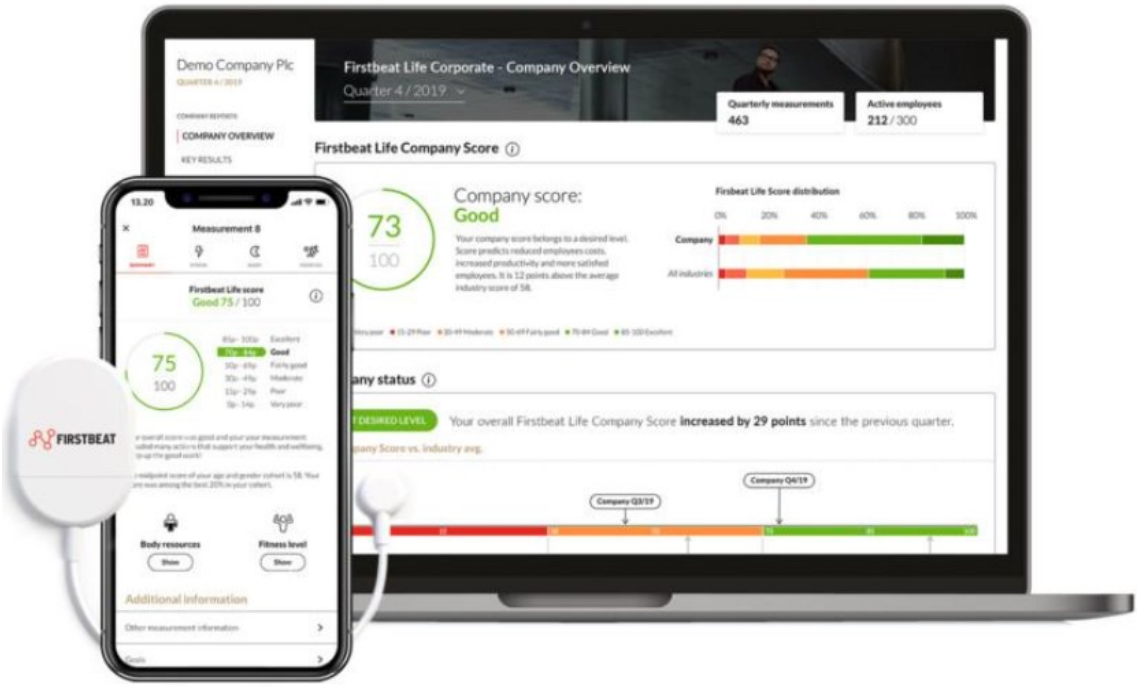

FIGURE 8. First beat application, HRV monitor and admin tool (Firstbeat Life 2023)

Firstbeats life package aimed at coaches to help them provide more impactful services to their clientele. Including the Firstbeat HRV monitor, the Firstbeat life mobile application as well as admin tool for accessing the clients measured data and results. The application has shown to be good as identifying trending risk factors and the effectiveness of actions.

4.4 Varian Medical Systems (Noona Healthcare): Founded 2013

Noona Healthcare is a subsidiary of Varian Medical systems. Noona offer a support application for oncologists and their patients to provide guidance whilst navigating their cancer diagnosis. The company was founded by Jani Ahonala (current Vice President at Varian) and Pasi Heiskanen (current Chief Operating Officer of Noona Healthcare). (Crunchbase, 2023). Noona Healthcare's headquarters are in Helsinki, Finland.

TABLE 5. Varian Company Information (Varian, 2023 & Finder.fi 2023 & Market Screener 2023)

Founded	2014
Company ID (Y-tunnus)	2590096-1
Website	www.varian.com/noona
Company Type	Public limited company (Varian) Private limited company (Noona Healthcare)
Stock Symbol	
Headquarters	Alvar Aallon Katu 5 C, 00100, Helsinki
CEO	Kari Markus Toimela (05/2019)
Personnel	289 (09/2022)
	Fiscal Period: 10/2021 – 09/2022
Revenue	EUR 50.60 million
Net income	EUR 1.60 million

Noona healthcare specialises in cancer care technology. They have produced a mobile application that allows for patients to monitor and report their symptoms to their consultants and doctors via the Noona app. This can then be used to improve care and patient outcomes. With real-time monitoring and early intervention, the service allows for a more patient-centric approach to cancer care. This is something that is rarely seen and fills a gap in cancer care by empowering patients to take a more active role in their treatment. Furthermore, it improves communications between patients and their health care providers allowing for more insightful data into the disease.

Noona healthcare's mission statement is the following: A patient outcomes management solution designed to engage patients in their care with real-time symptom reporting and monitoring, streamlined clinical workflows to promote evidence-based care, and access to rich data insights for better management and ongoing assessment over the course of care.

Noona health also prioritises the patient's well-being and quality of life more effectively than other older systems by letting patients communicate more freely and regularly about their symptoms to their doctors. This has shown effectiveness in improving mood as patients feel more engaged and positive. This communication also allows the patient to educate themselves in which Noona hopes boosts their optimism.

Noona have focused on cancer, despite their platform being potentially useful for studying many different diseases and chronic illnesses. This allows for a concise approach on a specific segment's needs as well as the ability to collect data on pre-defined patients. For example, data from one skin cancer patient could help skin cancer patients in the future. A collection of this data in the future could lead to finding patterns in certain age groups, nationalities, sex or skin pigments, allowing for better treatment with less assumptions or trial and error medications.

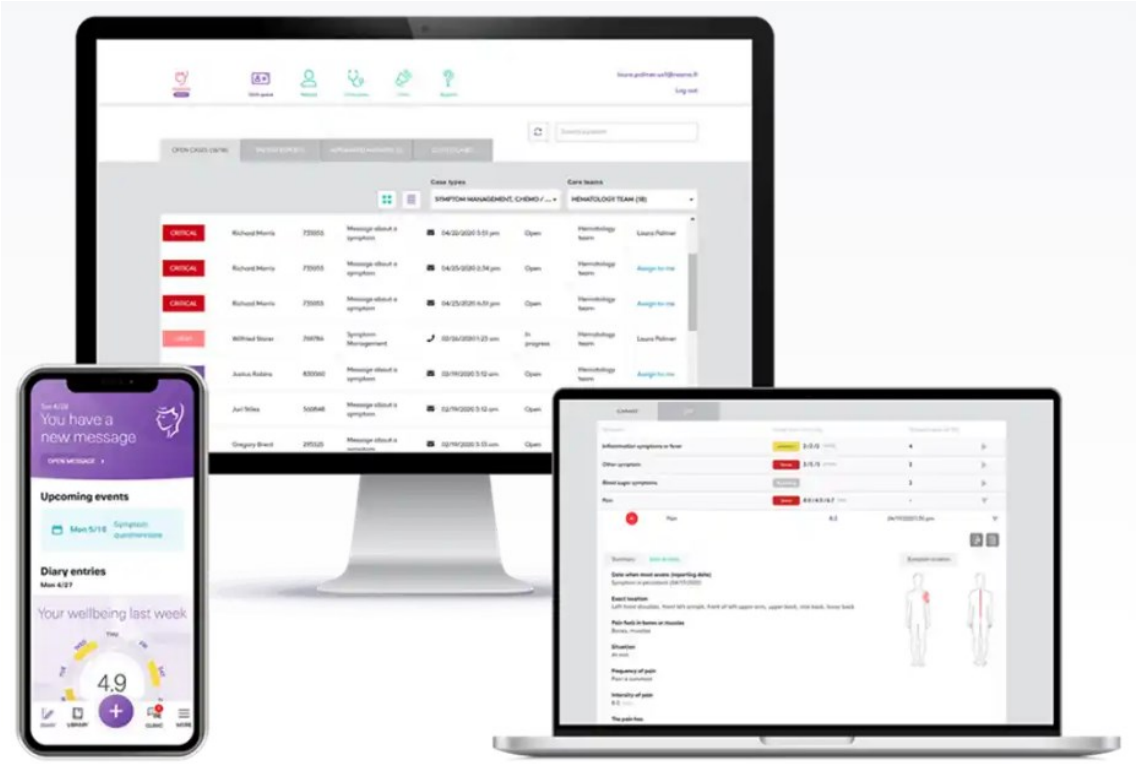

FIGURE 9. Noona Healthcare applications (Noona | Varian, 2023)

Noona's specialisation may also allow insights on other symptoms/side effects of treatment. It is common for patient's to respond differently to previously documented patients with similar cancer types. This is usually due to the stage or severity of the spread and type. Moreover, side effects are commonly medicated against on top of treatments, depression is very common and often medicated against to make treatment more bearable. Therefore Noona's approach aims to give the patient more of a voice outside of scheduled appointments.

Overall, these kinds of insights are useful to all those involved, consultants, oncologists, doctors and patients. Collecting data from previous similar cases could make the difference in the patient's recovery as well as the development of treatments.

Noona Healthcare raised €1.5 million EUR in 2016 from 3 seed rounds, before being acquired by Varian in 2018 for an undisclosed amount. Two of the seed investors were IT based investors with the lead investor being Inventure a Helsinki based venture fund that specialises in helping portfolio companies with talent expansion (CrunchBase, 2023).

4.5 Suvanto Care Ltd: Founded 2014

Suvanto Care support at home care with unobtrusive technology to care for seniors during their daily life (Suvanto Care, 2023). The company was founded in 2014 by Antti Haukipuro (current CEO). Suvanto Care's headquarters are in Rovaniemi, Finland. Suvanto Care is included in the thesis due to its similarities to Inlisol both companies appear to have the same solution with differences in devices and software. Although Suvanto has been around much longer they are yet to find success and so have been included as a benchmark.

TABLE 6. Suvanto Care Ltd Company Information (Suvanto Care, 2023 & Finder.fi, 2023)

Founded	2014
Company ID (Y-tunnus)	2654350-5
Website	www.suvantocare.fi/
Company Type	Private limited company
Headquarters	Hallituskatu 20 A, 96100 Rovaniemi, Finland
CEO	Antti Juhani Haukipuro (11/2015
Personnel	12
	Fiscal period: 01/2022 – 12/2022
Revenue	EUR 1.00 million
Net income	EUR -115,000

In contrast to the business strategies of emerging players like Inlisol, it is instructive to examine the case of Suvanto Care as a noteworthy example. Suvanto Care, an established entity in the health technology sector, specialises in providing IoT solutions. Their product comprises sensors and smart devices designed for the monitoring of elderly individuals within their homes. These IoT devices collect data, transmit it to a central hub in the residence, and generate a routine, documenting activities such as waking up, using the kettle or coffee machine, operating the microwave, or opening the fridge. A crucial feature of their solution is fall tracking, a capability that rapidly identifies instances of seniors falling at home, prompting emergency services or caregivers to intervene promptly. This

functionality significantly reduces the time an individual spends on the floor post-injury, addressing a critical concern, especially for those aged 60 and above, for whom falls can result in serious consequences such as broken bones and head injuries due to age-related health conditions.

In collaboration with Elisa, a prominent telecom company in Finland, Suvanto developed an application designed to complement their IoT devices. The application allows caregivers to access and monitor the routine of the senior, offering valuable insights for effective care. For instance, patterns such as nocturia, where an elderly person repeatedly gets out of bed at night, can be indicative of underlying health issues such as heart disease, diabetes, or infection (Leslie, 2023).

Elisa, with its significant market presence and extensive affiliations, played a role in productizing Suvanto's solution to enhance their market positioning. However, despite these collaborative efforts, the success of this strategy remains uncertain at present.

A notable departure from the successful business models observed in emerging companies like Inlisol is the absence of a clear focus on specific aspects of health in Suvanto's marketing and product offerings. Suvanto's target market encompasses care homes and elderly apartment buildings, a broad demographic typically aged over 65. This lack of specificity in target demographics and health focus represents a distinct difference from the strategies employed by thriving businesses in the health technology sector.

5 CONCLUSION

To navigate the health technology market there appears to be significant importance of well-defined goals, niche focus, and value addition for successful market integration. Case studies, such as Noona Healthcare, Oura, and Nightingale Health, serve as compelling illustrations of strategic market entry, emphasising the need for a targeted approach. The recognition of holistic approaches, education, and the growing shift towards preventative care further illuminates the evolving landscape of healthcare.

As we anticipate the continued influence of AI and technological advancements, the potential for more efficient task performance and personalised treatment plans based on demographics and inherited traits becomes increasingly promising. Drawing parallels between Inlisol's product and Suvanto's Elisa Digihoiva underscores the market potential for Inlisol, highlighting the critical importance of demonstrating value to end-users and healthcare professionals alike.

Inlisol, as a young entrant into the market, the recommendation is clear: focus on a niche area in healthcare, establish a foothold, and strategically expand. Understanding the target market's preferences, comfort levels, and the value proposition offered by their product as a service is paramount. This strategic approach will not only enable successful market penetration but also lay the groundwork for subsequent product development and expansion.

In conclusion, the roadmap for Inlisol involves meticulous consideration of market dynamics as covered in the PESTLE analysis, a dedication to providing tangible value, and a commitment to understanding and meeting the needs of both end-users and healthcare professionals. This strategic path positions Inlisol to not only compete but also thrive in the dynamic landscape of health technology.

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