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Research Topic

Dutch Primary Care Partial Digitalization

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Bachelor in International Finance

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Table of Content

Declaration of Authorship	2
Acknowledgements	3
Table of Content	4
Abstract	6
Chapter 1: Introduction	7
Chapter 2: Summary of Literature Review	9
2.1 Introduction	9
2.2 Medical Background	9
2.3 Waiting Times in Netherlands Healthcare System	10
2.4 Information Technology Background	11
2.5 Privacy Laws in EU	12
2.6 Culture	13
Chapter 3: Body of Thesis	16
3.1 Introduction	16
3.2 Methodology	16
3.2.1 Research	16
3.2.2 Interviews	16
3.3 Business Idea	17
3.4 Market Analysis	18
3.4.1 Design Thinking	18
3.4.2 Marketing Mix	20
3.5 Further Description of Services	21
3.5.1 Healthcare System	21
3.5.2 User	22
3.5.3 Medical Staff	22
3.5.4 Pharmacies	22
3.6 Development	23
3.7 Quality and Efficiency	25
3.7.1 Quadruple A	25
3.8 Implementation	27
3.9 Finance	27
3.9.1 Balance sheet	28
3.9.2 Income Statement	28

3.9.3 Cash Flow	29
Chapter 4: Findings	30
4.1 Introduction	30
4.2 Value Proposition	30
4.3 Business Model	31
4.3.1 Key proposition and Solution	31
4.3.2 Customer Relationships and Channels	32
4.3.3 Development, Revenue Stream and Costs	32
4.4 Production and Implementation	33
4.5 Financial Aspects	34
4.6 Impact	35
Chapter 5: Summary, Conclusions, and Recommendations	37
References	39
Appendices	43
Initial Investment	43
Monthly Expenses	43
Balance Sheet First Six Months Detail Projection	44
Income Statement First Six Months Detail Projection	45
Cash flow Statement First Six Months Detail Projection	46
Balance Sheet 6 Year Forecast	47
Income Statement 6 Year Forecast	48
Cash Flow Statement 6 Year Forecast	49
Loan Payment	50
6 Year Projection Ratios	50

Abstract

The world is constantly evolving even if we do not notice it. Healthcare systems however have stayed behind when it comes to innovations. This has happened since many systems consider that the medical assistance should remain as a physically present assistance. We have seen that over the past years technology has taken over every sector we can think of. Technological developments and upgrades are being presented everyday and in many ways.

Nowadays in the healthcare area we have devices and softwares capable of predicting many aspects from a woman's next ovulation to providing a diagnosis based on just a picture. Everyday more companies and governments are focusing on artificial intelligence and how they can connect it to the healthcare system. Since the healthcare system in the Netherlands is not digitized, before moving to artificial intelligence it is better to focus on improving the system without compromising the quality and efficiency of the same.

The government of the Netherlands is currently supporting and interested in e-health solutions. They believe that the use of digital technologies will help the country develop even more in social aspects. As well they are certain that in a near future, many different medical practices could and will be carried out remotely. (Ministry of Economic Affairs and Climate Policy, 2018)

This business plan demonstrates how the creation of an application could help in the partial digitalization of the hospital's primary care. It also explained the positive impact it can have and how it can lead the path to a future incorporation of artificial intelligence and machine learning.

Chapter 1: Introduction

The topic of healthcare systems has always been and will always be an important topic in every country. Today we are facing different situations that make everyone think that the system fails, needs improvement or it should completely change. The system varies completely from country to country. We tend to focus on underdeveloped countries since they are the ones that suffer the most due to corruption, lack of material and professionals, severe inhuman conditions or inappropriate installations for their necessities. For this business plan we will be focusing on the system of a developed country such as the Netherlands.

Netherlands is a country located in Western Europe that borders Germany and Belgium. (Europe :: Netherlands — The World Factbook - Central Intelligence Agency, 2020) The country has an expected population of 17,280,397 for July 2020 and a life expectancy of 81.7 years. Although it is a small country with 41,543 sq km, they managed to become a very important economy and also managed to develop a health system with a very good rate of acceptance. But what has made them reach this level? The government has been introducing healthcare reforms to tackle their major challenges which includes high rates of mental disorders, lifestyle-related problems, environmental health challenges and health inequalities (Kroneman et al., 2016) to provide a high quality service to their citizens. Could a partial digitalization of primary care increase efficiency comfort for users/patients and decrease waiting times without compromising the care levels? This is the main question we will be addressing through this business plan.

Different ideas come to our minds when we talk about innovation but that does not mean we have to build a new hospital that works only through artificial intelligence. We can perfectly innovate by upgrading existing ideas that previously did not succeed. In our case we will retake the idea of implementing and using e-Health. As we move forward through this business plan we will be explaining and providing further details on how we can take ideas of an existing medical app and create an application that is connected to the public healthcare system. We will also be demonstrating how our findings will have a positive impact not only for citizens but also for the entire country.

We choose this specific sector and idea for two main reasons: The first reason we consider is that we are living in a technological era and nowadays we can do almost anything from a mobile device. We can go from making a simple call to actually telling us how much time we have spent in front of a screen or even predicting our choices. According to studies, for the year 2015 around 500 million worldwide smartphone users were expected to have access or direct contact with a healthcare application. By 2018 it was expected that half of around 3.4 billion users had installed a health related application on their mobile device (Volk, Sterle and Sedlar, 2015). As years pass, the studies mentioned previously make more sense since everyday we see more

people connected to the internet. Every new product released introduces technological advances. This is a great opportunity for research and development because of current trends, consumer behaviors and technological advances that can be implemented in the system.

The second reason is because we are helping citizens to receive great medical assistance from the comfort of their house and also providing a solution to the country's increasing costs and waiting times. By developing this service, we directly or indirectly assist in the liberation of emergency and hospital rooms, doctors offices and schedules, etc. You might be asking, how does this help the Dutch economy? So to answer this question we can say that when developing a service like this, first of all we are able to provide assistance remotely. This means that the majority of the users will have no need to leave their houses unless the doctor requires it. At the same time the user becomes more responsible for their health and self management and this will bring a decline in hospital visits. With the visits declining, the current amount of investment for buildings, staff and materials might be considered in the financial statements as "excessive". The budget surplus could be used for other purposes that require more attention and resources. The possible results mentioned have also been supported through studies, as stated in an interesting article regarding the possible adverse effects (Stevens, 2019) *"the use of eHealth apps is expected to reduce health care consumption and health care costs. Also, eHealth is supposed to contribute to the fast availability of updated medical information, as well as to the provision of tailored care, independent of place and time. In addition, although research in the field is not conclusive, eHealth may improve self-management, health literacy, and healthy behavior."*

The structure of this business plan will be divided in three major sections: Starting with a literature review that explains all the data collected and analyzed to sustain our idea. The literature review would be subdivided into different categories that include: Medical methodology used for the purpose of this study, overview of the waiting times in the Netherlands, information technology, culture and privacy laws concerning the Netherlands and the European Union. We will then move to the second part which is the body of the thesis. In this section we will detail the main development and characteristics of our business idea. It will be subdivided into different categories: A description of our business, design thinking method used to develop the idea, market analysis based on several interviews and research, detailed service description, development of the application, financial statements, implementation and launching of the application, and lastly quality and efficiency. Finally, we will be moving to the conclusion of the business plan. In this section is composed of two categories: Findings and summary, conclusions and recommendations. In this last section, we will be describing and comparing all our findings through the whole research and development process of this thesis.

Chapter 2: Summary of Literature Review

2.1 Introduction

As mentioned previously, the use of the internet and its services have been increasing throughout the years. In our daily lives we see that everything is being more and more connected to the internet. As we want to illustrate that an application connected to public healthcare would provide very considerable benefits to a country, we decided to focus on a developed and well structured system such as the Netherlands. To demonstrate our point, we had to go through different sources and analysis of information. In this literature review, we will be explaining the findings and sources used to sustain our business plan. We will be focusing on the concepts and description of the medical and information technology methodology, waiting times in the Netherlands, privacy laws in the European Union and the Dutch culture. Different resources such as articles, official newspapers and studies have been used for the purpose of this business plan.

2.2 Medical Background

Medicine has a universal language and it is very complicated for someone who has minimum or no knowledge in the topic. Through this business plan we will be referring to just some concepts which are relevant to our main study, as you can see further in *table 1* (Iyawa, Herselman and Botha, 2020). But the first thing that we need to consider in order to understand this business plan is the difference between digital health, digital ecosystems and digital health innovation ecosystems. All three concepts are linked and in order to understand the meaning of digital health innovation ecosystems, we have to understand the first two concepts. According to (Iyawa, Herselman and Botha, 2020) in simple words digital health is considered as the improvement of healthcare services through information and communication technologies. Digital Ecosystems is a network of digital communities that are constantly interacting for different actions through a digital environment. Lastly, for digital health innovation it has been defined as digital health communities that work together to adapt and implement successful practices through the use of information and communication technologies that help in the monitoring of patients, as well as providing patients the management power of their health and their families. Understanding these concepts is the first step in our business plan since we are focusing on digital health innovation.

e-Health	E-health refers to the use of internet and web technologies in the provision of healthcare delivery service
Health and medical platforms	Health and medical platforms include online platforms such as online forums that help foster interaction between patients and experts

Wireless health/Wireless sensors	Wireless sensors refer to the use of different wireless monitoring devices situated in a wireless network used for monitoring patients' health by a physician.
Electronic health records (EHRs)	Electronic health records (EHRs) consist of all the combinations of a patient's entire detailed health information from past and previous visits to a health institution, which can be presented to a medical practitioner to make decisions regarding a patient's health.
Electronic medical records (EMRs)	Electronic medical records (EMRs) is the term used to collect, store and display only the medical information of a patient. It does not display the entire health history of the patient. Mostly it has been used for emergencies when a patient requires immediate assistance.
Privacy and security	Privacy and security are measures taken to ensure that patients' health information is well protected. Patients also want to maintain privacy in the way health information is accessed in EMRs
GP	General Practitioner
Primary Care	Refers to the first line of medical assistance. It is the first step before moving directly to a specific area of medicine.

Worldwide we are facing the same situation where users just search for health information without actually knowing what sources are reliable sources or understanding the concepts of the same. It is important that users begin to educate themselves with terms as simple as the ones mentioned above and to understand when it is required to seek medical assistance, as well as where and how to seek this assistance. This is the key and main objective in e-health. It is also important for us through the development and implementation of the application, since it would be necessary to have the user receive certain guidelines. For a proper use of our application, the user needs to be capable of understanding the importance and purpose of an application as we intend to introduce.

2.3 Waiting Times in Netherlands Healthcare System

Previously waiting times in the Netherlands have maintained a low level. Nowadays we can see that they have been increasing since the year 2014, which had an average of 2.95 weeks waiting time. It is not a massive increase but it is still considered a little high compared to previous years. (Pieters, 2020) In 2016 the increase went from 3.10 weeks recorded in 2015 to 3.52 weeks. Waiting times continued to increase in 2016, as the last semester of 2016 reported another jump of more than 6 weeks waiting time. (Pieters, 2020) The majority of cases referred to citizens needing assistance for allergies, ophthalmology, stomach, intestinal and liver problems.(Pieters,

2017) Throughout the years the waiting times in the Netherlands have been increasing even more, until the point in 2019 when the average waiting times have risen up to seven weeks (Pieters, 2020). This increase is two weeks longer than the maximum waiting time recorded in 2015. According to (Pieters, 2017), a possible reason for the increase on the waiting times could be due that the hospital care requires a higher budget in comparison to what they currently receive since the economy is growing faster and the budget provided to the health sector does not grow as fast.

2.4 Information Technology Background

Netherlands is considered a digital gateway, an important technological location and a pioneer in technology as they have a very innovative and complete digital infrastructure. As an overview and historical details, the Netherlands is responsible for the creation of Wi-Fi and Bluetooth as well as the AMS-IX ("About AMS-IX | AMS-IX Amsterdam", n.d.) which is one of the most important exchange points in the world. One of the reasons international companies have chosen Netherlands as their headquarters or main offices is because they possess a considerable amount of internet exchange and associated backbone connectivity, data centres and large cloud providers. (Ministry of Economic Affairs and Climate Policy, 2018)

Internet platforms offer major benefits, some of the benefits include easier and faster communication. As well, internet platforms have helped to improve knowledge by providing not only easier access to the information but also increasing databases with much more information recorded everyday. All these aspects have encouraged many companies to introduce internet platforms for daily professional and consumer use. The most basic examples are the platforms introduced for e-commerce. The Dutch are considered a highly educated workforce both locally and internationally, making them easily adaptable to new technologies.

The country has already implemented an innovation in the healthcare system by introducing an electronic patient record system. The system is of mandatory use for all general practitioners. The database gathers information from several providers, areas or speciality. To get the information different systems provide the information to the National Basic Registration Hospital Care (Wammes, Jeurissen, Westert and Tanke, n.d.) which is responsible for all the registrations regarding the healthcare system and collects medical, administrative and financial data of all the patients admitted to the hospitals in the country. Another source of database collection is called NIVEL Primary Care Database, which is responsible for collecting data from the general practitioners to monitor and review constantly the care, policies and current studies in the health sector.

2.5 Privacy Laws in EU

Regardless of the country we are focusing on, we should always take into consideration the privacy laws stated. In our case, we must follow the laws and agreements stated by the European Union and as well, the local laws and agreements of the Netherlands. At the time we are writing this document it is important to point out that according to the European Convention of Human Rights (Volk, Sterle and Sedlar, 2015), one of the fundamental human rights for the European Union and its members is the protection of privacy. It is important to build the safety environment or path of the service and product since the beginning of the process. A failure in the privacy system could easily cause the whole project to be rejected due to the risks, therefore we will be focusing on the privacy aspect since the moment we begin to ideate the prototype.

As we are developing an application that fulfills the necessities of providing online medical assistance and that it is connected to the public health system of the Netherlands, it is important to define in which category of business it falls since depending on the category, additional legislation may be required. Through the analysis of the business idea and the concept we want to give the project, the most related category would be for a medical device ("Medical devices - European Medicines Agency", n.d.). Even if we are not building a device, it would be considered under this category since it will be providing medical assistance through different mobile devices.

Besides building a safety barrier for all the users, governments, etc. it is important to point out that the medical staff must also adhere to different privacy control and follow the national and international medical field agreements that include privacy laws as well. Some examples in the European Union include the General Data Protection Regulation (GDPR), the Hippocratic Oath, the Declaration of Geneva, and the European Standards on Confidentiality and Privacy in Healthcare (Volk, Sterle and Sedlar, 2015).

As for the developers, they will be responsible for the development and safety barriers at all levels. Some of the guidelines that they must follow in the majority of cases include the development and implementation of processes that do not have a huge impact on the product or service but they serve as the first data protection block from the outside. Some examples could be development of virtual private networks (VPNs), establishment of security settings, control and alert of data collection and its use. Regarding the control and alert of a data collection, the developers must be aware that it is mandatory to follow the General Data Protection Regulation (GDPR) guidelines stated by the European Union. As stated on the European Commission Official Website and according to the Regulation (EU) 2016/679 of the European Parliament and

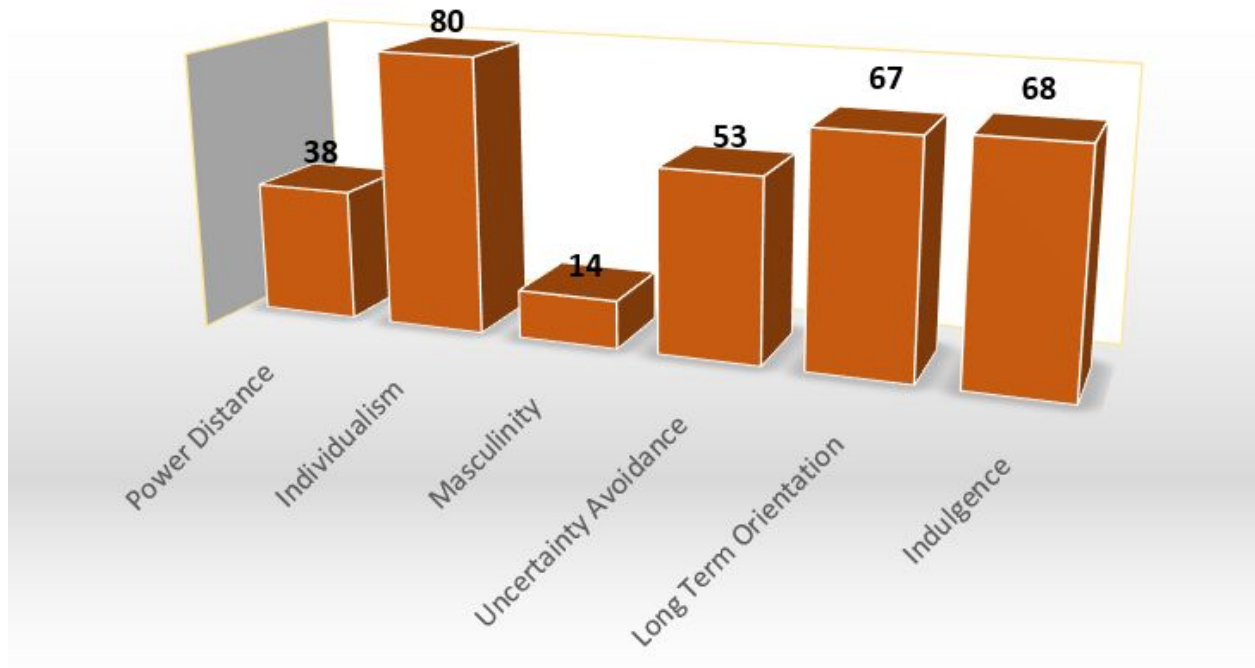
of the Council “*GDPR regulates the processing by an individual, a company or an organisation of personal data relating to individuals in the EU.*” (European Commission, 2020)

The entire business will be based around those guidelines which includes a clear explanation of data usage, why we are requesting and collecting data, how long we will manage that data and who will have access to this information. (European Commission, n.d.) It is important to point out that before moving on to the online service, the user must accept those terms and conditions. In case they are not accepted, they would immediately be directed to a healthcare center for assistance. All of these developments can vary and be more or even less depending on the location. These types of developments for privacy will be discussed further in the paper when we explain the development and creation of the service.

2.6 Culture

The country has a direct impact in the running of the healthcare system as it is one of their major responsibilities. The citizens of the Netherlands have been known for following the statements made by their authorities and in case something is not of their complete satisfaction they would directly communicate to the responsible as it is imposed in the majority of the cases worldwide. When it comes to implementations, they are known as fast adaptable persons since a long time back in history. They have gone through different organizational changes including the abdication of three queens before the actual King Willem-Alexander ascended to the throne. The majority of the Dutch surveys assess the healthcare systems in their country as very good or satisfied (Kroneman et al., 2016). As well it is known that the majority of their citizens will perfectly adapt to new technological changes since the use of the internet per household has been increasing tremendously and even older people are now becoming friendlier with mobile devices such as smartphones.(Kroneman et al., 2016)

For a further understanding of the main characteristics in the Dutch culture, we will be using the Hofstede 6-D Model graph. This model is useful and accurate to understand more in detail the culture of countries being analyzed (Country Comparison - Hofstede Insights, 2020). In our case we will be focusing only on the Netherlands, and we will be analyzing the six main aspects the graph takes into consideration.



Power Distance: Dutch like to work in a collaborative environment. As employees, they like to be involved in decisions and are more independent. They follow a hierarchy but only if necessary as they believe in equal rights. Dutch will make their decisions without expecting to consult with someone, unless it is required.

Individualism: It is the aspect considered towards the idea of independism from society. Netherlands has a high level of individualism, which means that they look out for themselves and close family members. This makes the Dutch less dependent from the societies where groups are necessary to take care of themselves.

Masculinity: With a score of 14, the Dutch society is considered Feminine. Countries that reach this level are known for keeping their life and work in balance. When it comes to management, they are considered supportive and decisions are reached through involvement of everyone. As for conflict resolution, they are known for being negotiators and discussions will last as long as it is needed to reach a common agreement.

Uncertainty Avoidance: The Netherlands prefers to avoid uncertainty if possible. This means that they are able to take some risks but still will try to do it the safest way to avoid very complicated situations.

Long Term Orientation: The score of 67 reached at this point reflects a society capable of easily adapting changes in their traditions, high interest in investments, savings and achieving

results. This is a very important aspect to consider, since it is a very important consideration for a project like ours.

Indulgence: The Dutch citizens are people capable of easily expressing their desire and impulses. This contributes to their strong beliefs in leisure time. They also possess a strong positive and optimistic attitude. This characteristic is very interesting since it determines how good or reaction they have once they receive changes or information. The previous point explains the adaptability of the Dutch and along with this point, it gives a more clear idea of the audience we are targeting with our project.

Chapter 3: Body of Thesis

3.1 Introduction

Now that we have a background of the areas we will be working with and the culture of the location we are going to target, we will move to the analysis of the development. In this section, we will be detailing the business idea and all the researches made to create the application. The information to be explained is backed up by research papers, interviews and articles.

At the moment we are writing this business plan, we have taken into consideration current scenarios for implementation. It is important to point out that our application is directed in providing assistance for primary care. Therefore, we have focused our launch in assistance to the current COVID-19 pandemic. Although it is a very recent disease and there is not enough information yet recorded to analyse more in depth the disease. We are aware that hospitals are building their own filter systems to determine if a person should go to the emergency room or directly to a COVID-19 section (Wagner, 2020). Further in the document, we will explain how our application can be a helpful filter for this type of emergency.

3.2 Methodology

When elaborating the structure of how the development should be, we started to review different articles and research papers to gain more knowledge about necessities, how to approach a market and how to build a prototype. We began the studies of marketing analysis and design thinking for this step and once we had enough information collected about the current situation in primary care and similar competitors, we started to interview professionals.

3.2.1 Research

Different websites, articles and research papers available through Google Scholar, ResearchGate and other sources were used for the purpose of this business plan. Based on this information, we brainstormed ideas and highlighted important topics and considerations we then discussed with the professionals. All the information considered was analysed before introducing it on this business plan.

3.2.2 Interviews

The next step we took was to interview several professionals to get more insights regarding suggestions, business models, professional point of view and opinion regarding the healthcare sector. The following list is of the people interviewed and their current job title.

- 1) Xavier Aldeguer: Director of the Department of Digestive Diseases in the Hospital Doctor Josep Trueta, the most important hospital in the Girona area. Doctor at Clínica Bofill. Gastroenterology professor Universitat de Girona, Medicine department. Professor at Universitat Oberta de Catalunya. Coordinator and Head of Department of Gastroenterology at Joint Venture of Girona area Hospitals. GoodGut cofounder
- 2) Xavier Hernandez: Senior Backend Developer and Backend Developer Team Leader at Leadtech
- 3) Milton Licon: Doctor in medicine and general surgery at La Lima Medical Center, Honduras. Chief Doctor at Pinehurst, Honduras
- 4) Ezequiel Galarce: VP, Behavioral Insights at Rally Health
- 5) Aram Hovsepyan: CEO Codific
- 6) Lilian Bodden: Nurse at Roatan Hospital, Honduras

Each one of the people interviewed helped clarify different sections of this business plan. The nurse and doctors were reached to get an insight of the healthcare and their point of view regarding digitalization in such a delicate sector. Along with the doctor's recommendations for diseases to be treated and an ideal path to follow, we interviewed Xavier Hernandez to get recommendations for the backend development.

Once we had these interviews, we brought them together and focused on the quality and implementation. Therefore we interviewed Codific CEO Aram Hovsepyan and Behavioral Insights VP Ezequiel Galarce. They helped us sort out the type of business model to follow and how to sustain the quality and efficiency of the service through the implementation.

Based on all this information recollected, we moved forward in building the business model and development process of the application.

3.3 Business Idea

As we are trying to implement a partial digitalization, we thought of a win-win option for the users and the primary care. Our business idea is a medical application capable of providing remote assistance to citizens and residents in the Netherlands. Users will have the opportunity to log in the application and have a live chat or video call with a medical professional.

The idea is for the user to go through an initial filter of symptoms and then be referred to a nurse or be directly referred to a hospital. The nurse will then evaluate the patient and determine if she can control the situation, and needs to refer to a doctor or a hospital. Finally if the patient is referred to the doctor, he or she will provide a diagnosis after a further diagnosis or refer the patient to the hospital.

The added value of our business idea would be that it is directly connected to the public healthcare and pharmacies. The user will have no need to leave his or her house for prescriptions or a checkup.

3.4 Market Analysis

We have followed the four principles of the marketing mix ("The Marketing Mix and the 4Ps: Understanding How to Position Your Market Offering", n.d.) before moving to the actual production of the application. All the information included in our market analysis has been collected through the different interviews made, analysis of similar applications and websites, and by following the steps of the design thinking process.

Before starting the marketing analysis it was very important to frame the real and actual problem we are trying to solve. Therefore to identify our problem and possible solution, we started the process by applying the first three steps of the design thinking process.

3.4.1 Design Thinking

The purpose of this methodology called design thinking, is to provide a solution based on real insights. To accomplish this goal we will follow the five steps of design thinking defined by Hasso-Plattner Institute of Design at Stanford (d.school) (DAM and TEO, 2020). These steps will help us to have a clearer idea of the problem and solution from an internal and external point of view. It is important to mention that the steps will conclude with a prototype and test, however we will have to go back to the prototype step once we have the business model established. Each of the steps are clearly detailed and explained below.

Empathize: The first step to identify the real problem is to actually understand what the user needs, wants or is expecting. Since through our research we have found that the Dutch are mostly satisfied with their healthcare system, it was hard to determine what was the actual necessity. So we took a closer look into the actual processes the patients go through when reaching the hospital. As mentioned previously, citizens who need assistance for allergies, ophthalmology, stomach, intestinal and liver problems are the ones visiting the hospital more often. (Pieters, 2017) Because of the increase of those visits, the waiting times have also increased. However through a conversation with Dr Xavier Aldeguer, he mentioned that the actual necessity was not actually reducing waiting times. The real necessity is to free the primary care of cases that could be treated online with the same results as visiting the hospitals (X. Aldeguer, personal communication, April 29, 2020). This solution would be of great use to the Dutch citizens since whenever they require primary care assistance, they could easily get it online from any spot in the country. It would not be hard to implement this type of solution based on their adaptability

characteristics. And as stated in the analysis of the Dutch healthcare system (Kroneman et al., 2016), most of the citizens in the Netherlands mentioned that they would perfectly accept the opportunity to contact a professional through the internet but as of today nothing has been completely introduced in the country.

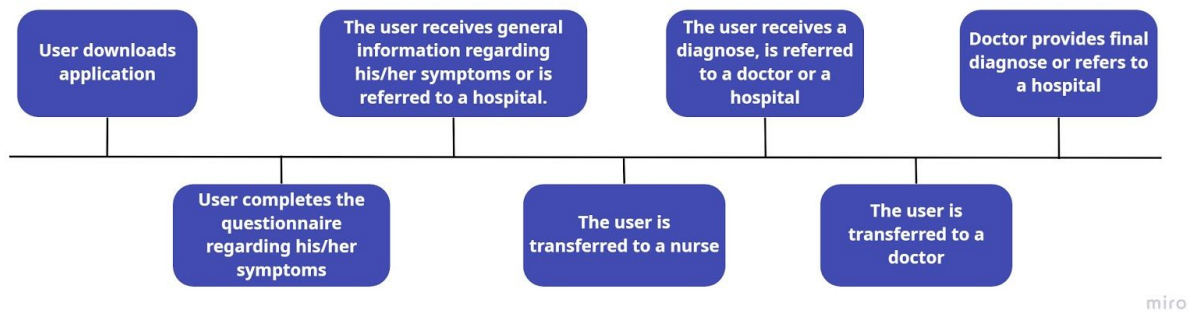
Define: As we move into this step and based on the information collected from our previous step, we are clear in the problem detected and the solution we want to provide. The healthcare system in the Netherlands is very efficient but the waiting times have increased, mostly because of visits that could be controlled before reaching the hospital. We are trying to improve the quality and efficiency of the Dutch healthcare system through digitalization.

Ideate: To reach this goal, we managed to combine several ideas as a solution. The main idea we have is the development of an application that could help the user reach a general practitioner without the need of leaving his or her house. The service will be completely linked to the hospital records and the users can have access to medical staff capable of providing simple or previously established permanent prescriptions without reaching the hospital. As well as virtual sessions for checkups and diagnoses. The user if needed, will be referred to the hospital by the medical professional or by the application itself.

Prototype: As we will be working with an online platform, the ideal prototype should be an application capable of adapting to all devices, browsers and operating systems. The user will be able to surf through blogs, recommendations, frequently asked questions and general information. All information provided will be previously reviewed and generated by experienced doctors. The user would have to log in to the application for live chat and video sessions. As mentioned before, the final prototype will be determined only after the business model is complete.

Test: Once we have the ideal prototype built based on our business model, we will come back to this step and launch it. Once launched, we will be able to start receiving feedback for improvement and upgrades.

After completing the previous design thinking steps and understanding what type of prototype we need to build, we elaborated a customer journey. This step is very important to understand before moving forward in testing the application since we have to be clear what path the user needs to follow when using our application. Further in our business plan, we will detail what conditions will the application follow in case the user is referred to a hospital before reaching a doctor.



3.4.2 Marketing Mix

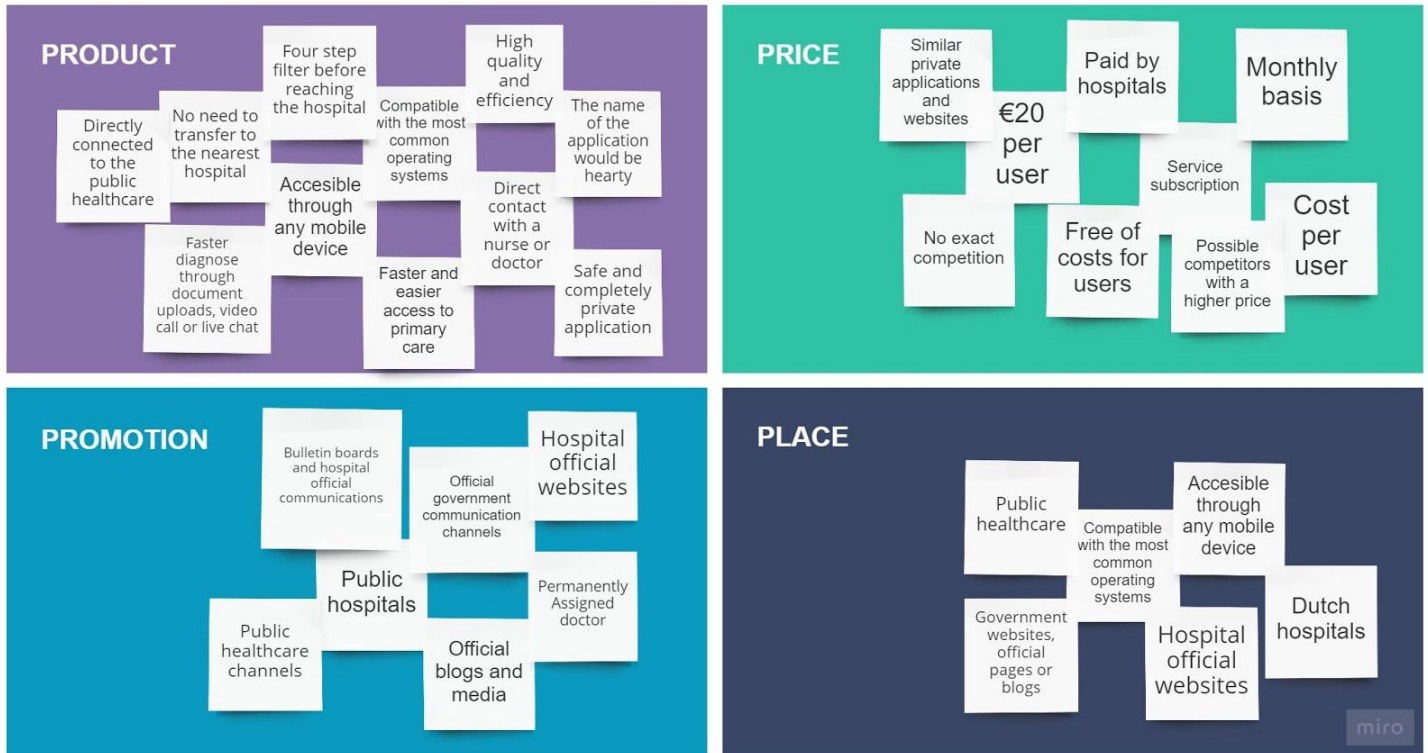
Product: Our application will be named Hearty. The application will be accessible through any mobile device and it will be available for all citizens and residents of the Netherlands. It will provide the user the opportunity to experience virtual medical assistance through video call or live chat. The application will have a filter of four steps before reaching a hospital. The user will be able to list all symptoms and upload images if necessary. Real time assistance will be provided and the user will be talking with a real and fully identified medical professional.

Place: Our target market will be the Netherlands since it is a country very opened to innovations. As mentioned by the Ministry of Economic Affairs and Climate Policy (Ministry of Economic Affairs and Climate Policy, 2018), Netherlands is looking for more e-health developments. As we mentioned before, Dutch are easily adaptable. This is a very high point when considering the location of the target market. Users would easily access the application through any mobile device, the application will be supported by the most common operating systems such as Android or IOS. The application will also be available through different official websites and hospitals.

Price: Through our analysis, we were not able to encounter any application with the features we propose. However we took into consideration similar competitors in Sweden, Canada and a private medical website in Netherlands to get an average pricing. The service will be free for the users since the costs will be directed to the hospitals. The estimated pricing we reached based on the analysis of similar competitors and our costs of production was €20 per user. The hospitals will be charged on a monthly basis at this fix rate. Increase in the rate is possible only after the first years and with previous agreement.

Promotion: We will be doing the advertisement through the hospitals. The doctors or the hospital itself can promote the usage of the application to their patients. As well since it would be

a service offered by the public healthcare, the application can be promoted on official government websites, hospitals main page, bulletin boards, official blogs, etc.



Once we reached a conclusion of the marketing analysis we moved to the development of the application.

3.5 Further Description of Services

In order to completely understand the services that would be provided by our business idea, we have divided into four categories that represent the benefit for all stakeholders.

3.5.1 Healthcare System

The healthcare system will be receiving a platform capable of connecting their records and medical staff on live interaction with users that require no emergency assistance. This means that the hospitals will be reducing the saturation of medical locations, unnecessary and non urgent requests in the emergency room, emergency rooms will be a lot more free for actual emergencies, etc. Based on these reductions, we are able to prove as well a decline in expenses. If we perceive the decline in expenses, once the healthcare system provides the report to central government, they are in capacity of determining if the service could be implemented through the

rest of the country hospitals and if an important reduction in costs is constant, they could use that money to invest in other areas for the benefit of the Dutch citizens or in other sectors that could require more financial assistance or attention.

3.5.2 User

The user in this case is the patient. The user would be able to receive medical assistance from any part of the country. This means that if they require a prescription for something as simple as a pill for a headache, they would have no need to make a medical appointment, or cross the city to go to the emergency room just for something as simple as a prescription. The user would also have more control over their health status as they would become their own managers and it would be under their responsibility whether they feel the need to contact a doctor or actually visit a hospital. It is an easier way for them to actually feel more comfortable with the healthcare system since nowadays the majority of the people do everything through the internet and everyday they are getting more used to using electronic health devices, this is also another way that they can trust their health through a virtual system.

3.5.3 Medical Staff

Although the medical staff is linked to the medical healthcare system, we can say they would benefit from receiving a huge amount of patients everyday that can take up to 15 minutes each, depending on the situation. They could focus more on providing a more detailed or specialized assistance to those who are in more urgent need and the ones that contact online would be treated in a faster way since they would previously pass a filter to determine if they need to speak with a doctor or not. As well, it is easier for doctors to follow patients from this type of services as all general practitioners in the Netherlands record the information on advanced electronic record systems. By using a platform like ours, they would still have access to all this information but mostly it would be easier and faster for all of them to view the clinical history of the patient since it would pop up when they start the session with the medical professional.

3.5.4 Pharmacies

Another added value to our service would be a link between the database of the platform and certain pharmacies. As we know when going to the pharmacy with a prescription from a public hospital, we can get discounts or even free medicine sometimes. So our idea is to implement a connection between platforms and once a user gets a prescription a QR code will be enabled for 48 business hours for a single use. The user can go to the pharmacies to get the medicine with this code and the pharmacies will be able to see in their system if the QR code had previously been scanned or expired. Once used it is registered in the database and that prescription renders invalid.

3.6 Development

The development of the application is probably the most critical part since we have to assemble everything that is needed for all parties involved. The development of the application will have to always follow privacy, state and international laws. We will be developing a unique customer relation management tool (CRM) that is connected to the Electronic Health Records of the healthcare system.

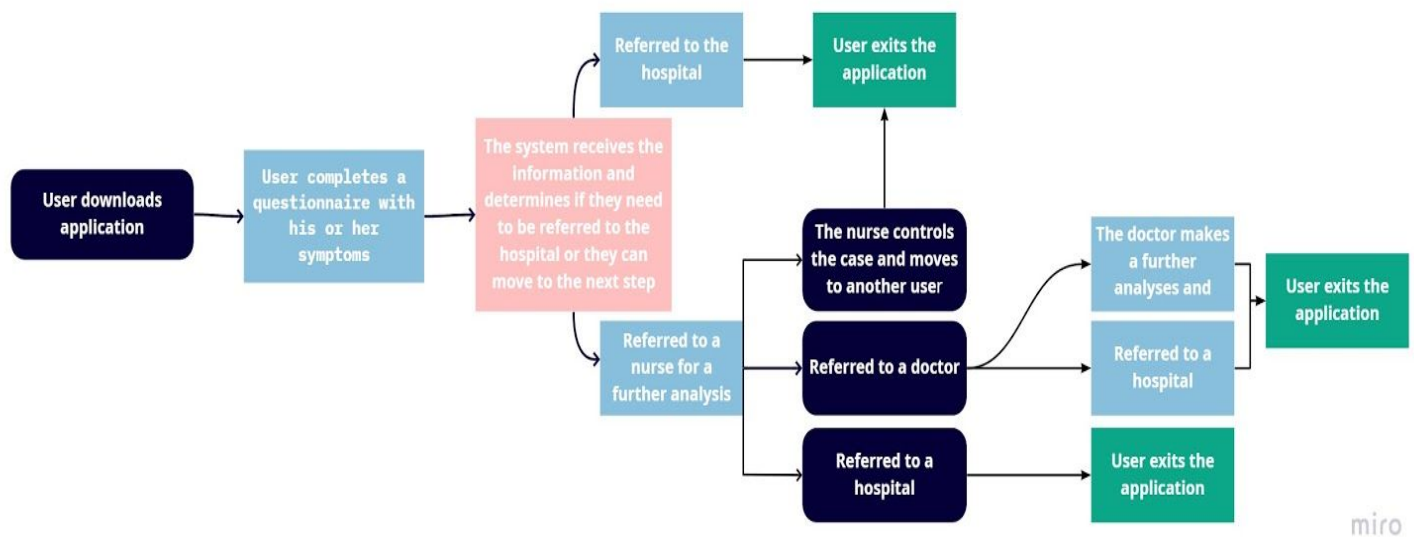
To build this bridge our developers would be in charge of creating a safety channel that encrypts all the information received and it limits its access. To protect the privacy and the clinical records, the users would not be able to review their medical history online but they would be able to see a summary of the previous online sessions they had through our application. It is important to point out that following the national and international guidelines, it is our developers task to create the safety environment for the use of the application and its information exchange.

As for the logins, we will be creating a login for the six different profiles using the platform. Although the citizens and medical staff have a unique identification number registered in the electronic health record system (Wammes, Jeurissen, Westert and Tanke, n.d.), we decided to create unique user ID's for reporting purposes. The ID created would be linked to the hospital database, unless it is requested and approved by the healthcare system and government authorities to use the state unique number assigned.

- Healthcare System: This would be a unique User ID used only by the hospital or healthcare authorities for monitoring.
- User: The patients in this case, will have to log in through a unique number created since the moment they enter their national identification number, that links to their personal health records.
- Nurses: Nurses would be the first contact of the user after passing an initial questionnaire filter. They would do a second filter and analysis of the symptoms the patient is presenting. If they determine the patient does not need to see a doctor and they can control the situation, they will manage it and close the session. As doctors, they have a unique identification number that would be used as their ID in the application.
- Doctors: After the diagnosis of the nurse, if the user still needs assistance from a doctor, they will be transferred to the specialist for further analysis. Medical professionals have a personal identification number from their institution, they would log in with this number.
- pharmacies: As we plan to connect the pharmacies to our platform as an added service, we will create a user login for them as well. Every pharmacy has a number for the store and that number is what we would use as their identification.

For the developers to organize their priorities when creating the application, we have created an initial application flow chart. The flow chart demonstrates the conditions the system needs to follow when a user is using our application.

After the market analysis and establishing initial guidelines, we will start developing the layout of the application. Once we have decided the layout we want, we will be going through the following steps of the process until the prototype is ready. The steps mentioned below, have been determined by (X. Hernandez, personal communication, April 23, 2020), a Senior Backend and Team Leader of the company Leadtech.



- 1) Our developers will be in charge of the backend and frontend creation which would include six different tables for the database that would be equal to each of the roles created in the application: User, Doctors, Nurses, Healthcare System, Admin, pharmacies.
- 2) Once the tables of the database are created, the developer would move on to the creation of a test customer relation management (CRM) for the interaction between the medical staff and the users. This test platform would include the link between the electronic health records and our platform, as well as the creation of all the users involved.
- 3) Based on the information provided by different doctors, we will be creating and adding information regarding symptoms and recommendations in our application. Also we will create a blog as a helpful resource for the user.
- 4) Once the information is ready and the developers in charge are still working on the CRM, along with front end developers we can start to review the design of the application.

- 5) As soon as the CRM is done we will begin the quality testing of it and once it is verified that it actually works, we will proceed to verify with potential clients (in this case the hospitals), if they require anything additional. Since the layout provided would be the final one once we migrate it to full development and deployment. Any change would need to be made after deployment.
- 6) Meanwhile, we will start the quality review of the website and content and if successful it will migrate to development and deployment as well.
- 7) The last step would be to link the pharmacies database to the application so the pharmacies would be able to view prescriptions directly and they would only need to validate the user when he or she visits the pharmacies.
- 8) Once we have everything ready for deployment we will launch it and start receiving the feedback for improvements.

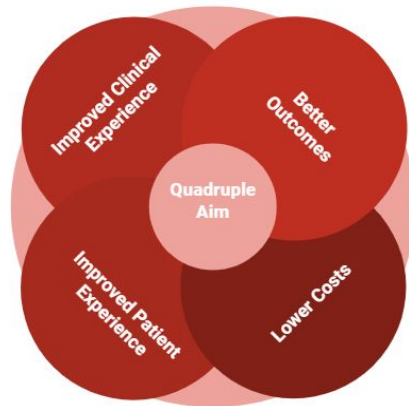
It is important to point out that as a prototype we are expecting the feedback for improvements in order to provide a more complete tool. We decided to go through a simple prototype first since we know more necessities and changes from users and professionals will be required once it is launched (Ries, 2011). So before we unnecessarily invest more money and time on a development that we would need to change later on, we prefer to receive all feedback possible to move on with necessary developments and improvements.

3.7 Quality and Efficiency

The development of the application may be ready in approximately four months after initiation. However we cannot deploy and launch an application if we are not sure that the quality and efficiency of the prototype will be compromised. To avoid this situation, we will be following the Quadruple A method (Itchhaporia, 2018). This method will help us achieve an appropriate patient experience without compromising the current quality and efficiency of the primary care in the Netherlands. The model will help us evaluate if our application is covering and will achieve the aspects it takes into consideration.

3.7.1 Quadruple A

Quadruple A is a model developed by the Institute for Healthcare Improvement (IHI). The purpose of this model is to tackle the four key aspects needed for the optimization of the healthcare system. (Health, 2019) This model is strongly followed in the United States of America to constantly improve the patient's experience. After measuring the quality and efficiency would not be compromised, we are able to move to the launching and implementation of the application.



Improved Patient Experience

The first focus of the quadruple aim is to achieve an improvement in each patient experience by focusing on the quality. The purpose is to reach stability in the effectiveness of the service, safety and patient education. By achieving an improvement on the patient's education regarding healthcare, we are improving their self control when it comes to managing their health (Stevens, 2019) .The patient will be capable of determining the best tools or practices considering their health.

As we mentioned before, it is an important factor to educate the users. Making them more responsible for their health is a key aspect in our application. Once this point is achieved, we are able to easily follow the next steps.

Better Outcomes

This point refers to the impact of a majority of the population. After having several patients improve their experience, it becomes a daily practice. Once a small group tests our application and improves the experience, the usage of the same will become more common every day. Other patients will then be following the same steps as the initial group and by having more people improving their patient experience, we will see a strong impact in the decrease of hospital visits and more liberation of the emergency rooms.

Lower Costs

As the previous two steps demonstrate their impact, at the same time we will see an impact in cost reduction. Healthcare will be able to use that additional budget saved in improvements for their area or the government can shift that additional budget to other areas in need.

Improved Clinical Experiences

The combination of the three aspects mentioned before lead to an improvement of the clinical experience. It is important to mention that the improvements take time to actually be reflected but once we start applying these four important aspects, we will be able to appreciate slow but effective changes.

Based on the explanation previously made, we can determine that the quality and efficiency of the primary care service would not be compromised. It is important to consider all of these aspects when building the prototype since we have to build an application providing a solution for improvement. In our findings sections, we will be explaining how we are linking this approach to our final prototype proposed.

3.8 Implementation

Based on the information collected and the interviews made, professionals have all agreed that the launching can be done anytime and it will be very welcomed. They also stated that due to the current COVID-19 pandemic, it would be a very wise solution for the hospitals to apply. But from the developers point of view the development of the program can range a minimum of 4 months for the prototype to be ready. Based on the limited and constantly changing information we have for COVID-19, experts predict the virus will be present at least for 2 more years or until a vaccine becomes effective. One of the specialists interviewed (X. Aldeguer, personal communication, April 29, 2020), mentioned that our application could be a solution for the “filters” hospitals are currently implementing to determine if a person visiting the hospital corresponds to COVID-19 section based on the symptoms or not. This fact was also mentioned in the article (Wagner, 2020) and it was also brought up by Codific CEO, (A. Hovsepyan, personal communication, May 8, 2020), who explained how in Belgium they have rushed to introduce a similar system as our application, telephone and SMS assistance to determine if a person has COVID-19 symptoms. However Belgium was not able to succeed with this integration since they did not design the system properly and it presented a lot of issues.

Based on this explanation and the situation the world is going through at the moment of writing this thesis, we have determined to start developing the application as soon as possible and launch an initial prototype. The application will be completely functional by December.

3.9 Finance

In order to develop this application we built the financial statements for the first 6 months of year 2020 which would be the estimated amount of time to produce the application. Since we plan to launch the application by December, projections were made for the next 6 years.

As you can appreciate on images (I. Initial Investment and II. Monthly Expenses) of the appendices we have a total initial cost with monthly expenses of €153,000 for the first 6 months of development, making this the initial investment. The initial investment of €153,000 needed for this business would be obtained through a distribution of 40% debt and 60% equity. The equity will be raised between the only founder and family members. The distribution of the equity would be €50,000 from the founder and the remaining €42,000 will be provided from family members. Meanwhile the loan would be requested for the amount of €61,000 at a rate of 2,5% compounded monthly. As you can see on the image (IX. Loan Payment) of the appendices, the loan would have a monthly payment of €1,083, making a total of €12,996 per year. The loan would be completely paid off by the end of year 2026.

3.9.1 Balance sheet

For the balance sheet, please refer to images (III. Balance Sheet First Six Months Detail Projection and VI. Balance Sheet 6 Year Forecast) of the appendices. You will see we only have assets for the laptops at the moment since we do not require building or additional equipment. Depreciation for the same was calculated and the forecasting for the following years, show us a good liquidity for further investment. Planning for future investment is mentioned later on the business plan.

3.9.2 Income Statement

The image (IV. Income Statement First Six Months) of the appendices, shows the income statement projection of the expected 6 months of production in year 2020. As this time is dedicated to production and no sales are expected to be made until the end of year 2020, we are only having expenses. For the following years, starting in 2021 the numbers demonstrate a positive impact. To understand the improvement of those numbers, we must take into consideration two important points.

The first point is that we are expecting a monthly payment from the hospitals for the use of our application. Therefore, we based our pricing on the amount similar competitors use as mentioned on the marketing analysis previous. Our pricing model is a monthly fee for the client and a no charge use for the users, the monthly pricing is based per user. Since we know the number of visits to the hospital can fluctuate between areas, it is the best practice to charge per user. The rate decided is for €20 since similar websites and applications (Netherlands ("Rates", 2020), Canada ("Maple", 2020) and Sweden("KRY – See a Doctor by Video", 2020)) with less features are charging even more than the double.

We then multiple the amount per user times the amount of users using the application that month. For this step we considered to start with a minimum of 10,000 users, since in the Netherlands has a very well established healthcare system and it is a small and good number to start with in the biggest cities like Amsterdam.

The second consideration is that we expect a minimum of 10% growth each year for 6 years. Based on the good results of the first year, our projection reflects the actual potential of the application after its launch.

To better understand these projections, the image (VII. Income Statement 6 Year Forecast) on the appendices reflects the forecasting of this expected growth for the following years.

3.9.3 Cash Flow

We will be experiencing a good situation for the first 6 months of 2020 as we will have enough cash to cover all the production expenses before we launch. Starting year 2021 we are expecting sales already and a monthly payment for the same.

As you can see on images (V. Cash Flow Statement First Six Months Detail Projection and VIII. Cash Flow Statement 6 Year Forecast) of the appendices, we are going to have a lot of liquidity for the next few years even if we project an annual 10% growth. Therefore, that additional cash will be invested in new equipment and developers to upgrade the application. As we mentioned before, we are looking into artificial intelligence and other upgrades in the long term.

The projections will remain the same as we will consider this excess the payment option for the upcoming changes.

Chapter 4: Findings

4.1 Introduction

Through the study of this business plan we have discovered many interesting factors to consider when it comes to developing an idea as big as partially digitizing the primary line of public healthcare, specially in a developed country like the Netherlands. As we were moving forward with the studies, we understood that our idea had to be worked around two systems for it to be successful. The first system of interoperability referred to the integration of electronic medical records and the accessibility, need and visibility of the application and its features for the users. The second system was the billing system as we needed to understand until what level automatization is required to determine costs and features. Also taking into consideration the needs doctors are currently having (E. Galarce, personal communication, May 14, 2020).

While brainstorming ideas and gathering the necessary information, we found out that hospitals would welcome this type of applications. But they would welcome it even more with an added value (X. Aldeguer, personal communication, April 29, 2020). Therefore since we already have the development and database established with the development team, we decided to add more features to our initial business idea. By adding new features and establishing a layout of our application, we completely cover the first system needed. After establishing the first system, we moved to the financial statements to determine the most appropriate revenue stream and service costs.

Further in this section, changes, new features and financial aspects will be explained.

4.2 Value Proposition

For our business idea we have identified as stakeholders the users, the doctors, the nurses and the hospitals. Therefore, we have determined the value proposition for each of them.

Users: The users will use our application for convenience. The commodity of not leaving the house is a top point for many users.

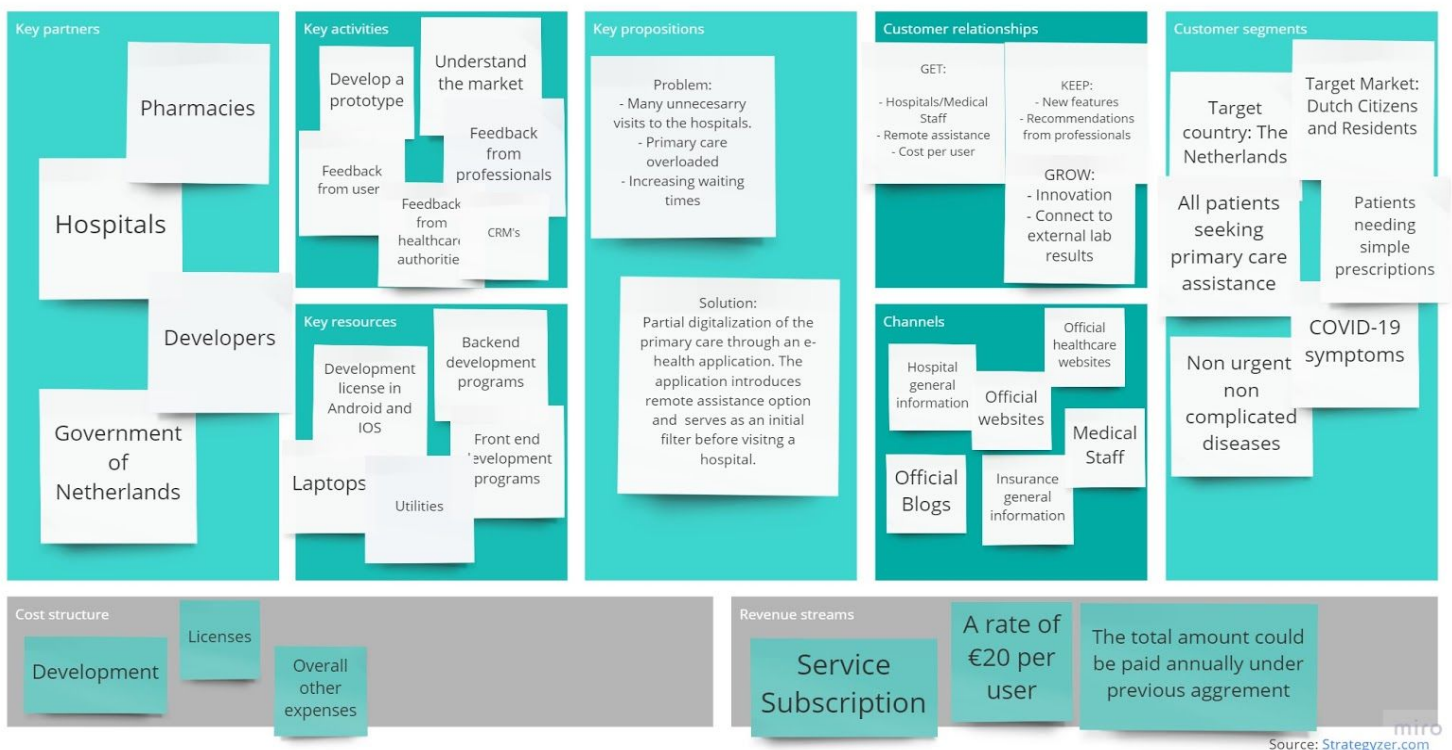
Doctors: They will be able to provide faster assistance and workload would decrease.

Nurses: They are able to filter correctly the patients before reaching the doctor or the hospital. Reduces their workload as well.

Hospitals: They would see a decrease in their costs since more than one person will be doing the same job for the same cost.

4.3 Business Model

As we mentioned in the body of this thesis, we developed a business model based on the observations received from the professionals interviewed and the information gathered through the investigation. The image below shows all the information needed to start the development of the ideal prototype. As we have been explaining, the aim of the application among others, is to avoid unnecessary visits to hospital. Therefore by doing the business model we have been able to determine how the ideal prototype should be.



4.3.1 Key proposition and Solution

Our key point has been identifying the main problem primary care is facing. As we appreciate in the previous image, three main problems were detected. Primary care is experiencing an increase in their waiting times. Their capacity is reaching or surpassing the maximum levels since they are constantly receiving people that do need to visit the hospital necessarily.

A clear example is when people with a simple skin rash caused by an allergy or simply by heat, visit the emergency room for assistance (X. Aldeguer, personal communication, April 29, 2020). In cases like the previously exposed, the majority of doctors do not last 30 minutes with the patient. Often they only prescribe a cream and the next day the skin rash is much better. We are

mentioning this example since it is important to understand the problem clearly. By having a person with a simple skin rash visiting the hospital, they go into a waiting queue. While the person with the skin rash is waiting, another patient goes into the hospital seeking assistance. This second patient is visiting because he or she has difficulty trying to take a deep breath, this person goes into the queue as well. Unless the other patients are in a critical or complicated situation, the first person to be assisted will be the skin rash patient since he or she was first in line. However, once the second patient goes in with the doctor he or she is diagnosed with pneumonia and needs immediate intervention. If the first patient had an application as our's, he or she could have gotten the prescription online and the second patient would have been assisted faster. Therefore we propose an application providing remote assistance directly for primary care cases and connected to pharmacies. The application would be available for all Dutch residents and citizens in the country.

4.3.2 Customer Relationships and Channels

We will be getting customers by offering virtual primary care assistance as a user free service through healthcare channels, official blogs and websites, and hospitals.

After getting users to connect in our application, we will retain them by adding updated content such as recommendations on a blog section controlled by medical professionals. New features such as connecting the application to smart devices for more accurate information when reaching a medical professional will also be added.

We expect to grow in the market and expand to other locations. We plan to increase the features even more by connecting the application to external laboratories, for example. This way the doctors or nurses will be able to view the results immediately and not wait for patients to deliver them to the hospital.

4.3.3 Development, Revenue Stream and Costs

To develop this application, we need a minimum of three developers to complete the prototype of the application and deliver it in a minimum of four months and a half. As well we must collaborate with the healthcare authorities and local hospitals. After reaching agreements with the corresponding authorities, we are able to move forward with the pharmacies and present the business proposal to link their database with our application.

We also analyzed our costs and similar websites in the Netherlands ("Rates", 2020), Canada ("Maple", 2020) and Sweden("KRY – See a Doctor by Video", 2020) to compare prices and establish our revenue stream. We decided to go for a service subscription at a rate of €20 per

user. The explanation of the pricing established will be detailed in the financial aspects of this section.

4.4 Production and Implementation

Previously we followed the design thinking process to determine an ideal prototype when doing the marketing analysis. However as we mentioned in the marketing analysis, the final prototype would be determined until we had developed the business model. The customer journey and the flow established before, will remain the same. But we are changing some features previously not considered in the application. As well, we will be improving the COVID-19 approach for implementation.

Our final prototype will have homepage layout with a login section, frequently asked questions, blog section and a request virtual assistance button. The user will need to log in with his or her previously created unique ID or they will need to create one. When clicking on the virtual assistance button the following actions will take place:

- 1) A list of items with the most common diseases and symptoms will be displayed for the user to fill it out. The list will be made and reviewed by the doctors, taking into consideration only primary care situations. Some suggestions made by the doctors include mild asthma conditions, diabetes control, simple kid sickness, mild trauma, stomach diseases such as reflux, dermatology, among other suggestions (X. Aldeguer, personal communication, April 29, 2020) and (M. Licona, personal communication, May 15, 2020). Due to the current pandemic, the list of items will also include COVID-19 symptoms.
- 2) The system through an algorithm will evaluate the responses of the user and if they all match for COVID-19 symptoms for example, he or she will be referred directly to the hospital. In other cases the algorithm based on conditions provided by the doctors, will evaluate the responses and determine if the symptoms correspond to a more serious condition that requires direct hospital assistance.
- 3) If the user is referred to the hospital, the application will show a message saying they need to see the hospital immediately. If the symptoms can be managed online, the user will be offered the possibility to be transferred to a nurse. They will also be offered the possibility to schedule a call with a medical professional if it is not an urgent need and they do not want to wait online. (E. Galarce, personal communication, May 14, 2020)
- 4) The users will have the possibility to upload documents at this stage. The documents option can help the doctor or nurse to better identify the condition of the patient. (X. Aldeguer, personal communication, April 29, 2020)

- 5) Users will be able to have a live chat or video call with the nurse or doctor for a more personalized and accurate assistance.
- 6) Prescription can be generated online if necessary and the pharmacies database will be connected to the application. The patient can reach the pharmacies and with the proper identification, he or she can claim the medicine prescribed.
- 7) The application will also flag the patients with urgent need versus the non urgent patients based on their symptoms. If a patient needs urgent attention it will move to the top of the queue. The patient is responsible for all their health information introduced. The conditions of urgent and on urgent patients, will be determined through criteria established by the doctors.
- 8) Doctors and nurses will be able to view the flags of each patient on the dashboard displayed.
- 9) The dashboard available for doctors and nurses, will also display the medical files of the patient. This helps the medical staff to provide faster assistance and save time when asking questions regarding their previous health records. (M. Licon, personal communication, May 15, 2020)

The prototype requires a minimum of 500 hours of work according to the developers (X. Hernandez, personal communication, April 23, 2020). Since the maximum hours per day allowed to work is 8 hours, we will need a minimum of three developers to have the prototype ready in at least four and a half months.

Once we have the prototype settled we will then launch it initially with a small number of hospitals, ideally 30. Before launching the application, the doctors and nurses need to get used to it as part of their workflow. As they get used to it, within time practice will become much easier. As for the users, they will need to be explained the purpose and responsibility of the use of the application. It is important to point out that the users will always have the option to go to a hospital regardless if they can be transferred to a medical professional or not.

Future upgrades of the application have already been considered and will be explained in the conclusion of this thesis.

4.5 Financial Aspects

Through our calculations, we can see that the development of the application does not require a huge investment and it can be developed in a few months. The liquidity we are going to gain due to the projected growth if we keep the same €20 per user rate, can take us to a level where we can consider future investments. It is important to also point out that through the analysis, we have discovered that there is no need for a huge debt to have a successful project.

As well, we have calculated the ratios for the 6 years forecasting and based on the results, we can see that our projections are considered good financial aspects. Besides requiring a low investment, the return we will be gaining can be used to speed up developments and improvements as we mentioned before. It is important to remember, we are expecting to introduce advanced features and those can gain us even more market.

Complete financial statements can be found in the appendices of this thesis.

4.6 Impact

Our application at this point becomes a triage for the hospitals and an assistance for the citizens. It certainly helps filter the patients and keep the hospital visits under more control (M. Licona, personal communication, May 15, 2020). Since the application causes a reduction in the primary care visits, the hospital could also see a reduction in their expenses as we mentioned before in the research.

With the new features taken into consideration the application can certainly have a strong impact, especially during the difficult times the world is facing. As we now know, the hospitals are going through a lot of pressure and they are running out of resources to manage the magnitude of the COVID-19 pandemic. Since our application would have a dashboard for the doctors to view who has urgent needs and their symptoms, this could help them detect any potential COVID-19 cases or treat patients with any other mild symptom before it develops into something with a higher risk (M. Licona, personal communication, May 15, 2020) and (X. Aldeguer, personal communication, April 29, 2020).

As for users, they will become more responsible for their health since they would be able to manage the way they prefer to be assisted depending on their symptoms. They would also reach professionals easier and they could reach them when they start to develop symptoms and not until they are already sick.

The healthcare can benefit as well by not only having cost reductions but also they can have a better control of the patients visiting the hospitals. It also helps identify the percentage of who requires the most visits and who can be treated remotely. The percentages can be identified through the indicators of health condition and health habits. (E. Galarce, personal communication, May 14, 2020)

As a result of everything mentioned above, we can say that partial digitalization of the Dutch primary care is possible without compromising the quality and efficiency of the service. Netherlands had previously tried to pursue e-health but unfortunately, they were not able to

accomplish their purpose. However remote care in the city of Zwolle has been successful. In this city it was established for 3,000 patients over 60 years and with a condition of thrombosis to use self-measurement and also to receive remote care. The results have been positive for years, and they have been proven due to the decrease in the outpatients clinic. Ever since Zwolle used this strategy, more locations like Groningen and Doetinchem have followed and the result remains the same (Ministry of Economic Affairs and Climate Policy, 2018).

If people have been hospitalised at the right time due to this simple strategy, our application can push that even further and prevent it by triggering the patients and assisting patients before the situation becomes more complicated.

Chapter 5: Summary, Conclusions, and Recommendations

Although the Netherlands is a country capable of adapting to anything in a blink of an eye, implementation is never easy. It is going to take time for people to get used to a change in the system. The change in their system can be welcomed but we have to also think how we can keep that system on continuous upgrades. As we know, healthcare is not limited to public hospitals. We can focus as well in other sectors such as insurance companies which are always looking for new products and services to offer their customers (E. Galarce, personal communication, May 14, 2020).

Machine learning is currently a hot topic in medicine not only because they are thinking of taking the system to the digital world. But also because through the COVID-19 pandemic both healthcare and government authorities have realized that everything in the world is changing towards remote assistance. Since e-health implementation has speeded up, previous professionals resisting the change will need to accept it (E. Galarce, personal communication, May 14, 2020). The application can boost this sector in the long term by introducing features such as connecting to external laboratories to store the patients test results and have them ready for the doctor (X. Aldeguer, personal communication, April 29, 2020).

This added value could take us to a new market which could be the private hospitals and insurances. By proposing an upgraded application to the insurance companies, we will be able to secure their portfolio of customers (E. Galarce, personal communication, May 14, 2020). Generally insurances and private hospitals have a similar application or service, however we will be able to offer them features already integrated that they do not possess.

The next upgrade could be Machine learning and artificial intelligence by enabling a storage of several images in the server. The images will be of symptoms and conditions of certain diseases and they will be used to compare and contrast the image provided by the patient. A match with the image located in the server will return as a result to the patient a direct diagnosis and will allocate the image uploaded by the patient in their records. If the same patient uploads the same image or with the same conditions a second time, the system will refer him or her to the hospital directly.

This integration will of course increase the cost of the application. As we have mentioned before through the business plan, the application will help in the reduction of costs. And as more hospitals will realize that additional costs are no longer necessary, a fair agreement would be to still charge per user but lower the amount to around €0.60 and receive 10% of the hospital savings the hospitals are having due to the implementation of our application.

In conclusion, we can do so many things with technology without compromising other aspects like quality and efficiency in our case. The key takeaway of this business plan is to understand well the necessity. Just by knowing this, we are able to come up with the most appropriate strategy for development and implementation. But we should always remember that partially digitizing primary care does not mean we are substituting necessary hospital visits.

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Appendices

I. Initial Investment

Start-up Costs	
Computer hardware	€ 2,778.00
Software	€ 60,000.00
Legal and other professional fees	<u>€ 4,000.00</u>
Total	€ 66,778.00

II. Monthly Expenses

Ongoing Monthly Expenses	
Salary of owner-manager	€ 5,000.00
All other salaries, wages, & commissions	€ 4,800.00
Payroll taxes or self-employment tax	€ 5,390.00
Advertising (print, broadcast and Internet)	€ 100.00
Utilities	€ 200.00
Internet connection	€ 80.00
Application Maintenance	€ 1,000.00
Interest & principal on loans	€ 1,035.44
Miscellaneous	€ 2,000.00
Total	<u>€ 14,215.44</u>

III. Balance Sheet First Six Months Detail Projection

2020 Six Month Details Until December 31st

Assets							
Month	June	July	August	September	October	November	December
Current Assets							
Cash	€ 152,070.63	€ 143,772.50	€ 135,474.38	€ 127,176.25	€ 118,878.13	€ 110,580.01	€ 102,281.88
Non Current Assets							
Depreciation	€ 38.58	€ 38.58	€ 38.58	€ 38.58	€ 38.58	€ 38.58	€ 38.58
Net Fix Assets	€ 2,778.00	€ 2,739.42	€ 2,700.83	€ 2,662.25	€ 2,623.67	€ 2,585.08	€ 2,546.50
Total Assets	€ 152,070.63	€ 143,772.50	€ 135,474.38	€ 127,176.25	€ 118,878.13	€ 110,580.01	€ 102,281.88
Liabilities & Owner's Equity							
Month	June	July	August	September	October	November	December
Current Liabilities							
Accounts Payables	€ 180.00	€ 180.00	€ 180.00	€ 180.00	€ 180.00	€ 180.00	€ 180.00
Non Current Liabilities							
Long term debt	€ 61,000.00	€ 60,044.49	€ 59,087.00	€ 58,127.51	€ 57,166.02	€ 56,202.52	€ 55,237.02
Total Liabilities	€ 61,008.25	€ 60,055.44	€ 59,100.63	€ 58,143.85	€ 57,185.06	€ 56,224.28	€ 55,261.50
Total Equity	€ 91,062.38	€ 83,717.07	€ 76,373.74	€ 69,032.41	€ 61,693.07	€ 54,355.72	€ 47,020.38
Total Liabilities	€ 152,070.63	€ 143,772.50	€ 135,474.38	€ 127,176.25	€ 118,878.13	€ 110,580.01	€ 102,281.88
+ Shareholders Equity							

IV. Income Statement First Six Months Detail Projection

2020 Six Month Details Until December 31st

Year	June	July	August	September	October	November	December
Sales	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Production							
Expenses	€ 10,000.00	€ 10,000.00	€ 10,000.00	€ 10,000.00	€ 10,000.00	€ 10,000.00	€ 10,000.00
Gross Margin	€ (10,000.00)	€ (10,000.00)	€ (10,000.00)	€ (10,000.00)	€ (10,000.00)	€ (10,000.00)	€ (10,000.00)
Gross Margin							
%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Expenses							
Wages	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00
Administrative and Marketing							
Expenses	€ 180.00	€ 180.00	€ 180.00	€ 180.00	€ 180.00	€ 180.00	€ 180.00
Depreciation	€ 38.58	€ 38.58	€ 38.58	€ 38.58	€ 38.58	€ 38.58	€ 38.58
Utilities	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00
Other	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00
Total Expenses	€ 7,180.00	€ 7,180.00	€ 7,180.00	€ 7,180.00	€ 7,180.00	€ 7,180.00	€ 7,180.00
EBITDA	€ (17,180.00)	€ (17,180.00)	€ (17,180.00)	€ (17,180.00)	€ (17,180.00)	€ (17,180.00)	€ (17,180.00)
EBIT	€ (17,141.42)	€ (17,141.42)	€ (17,141.42)	€ (17,141.42)	€ (17,141.42)	€ (17,141.42)	€ (17,141.42)
Interest							
Expenses	€ 1,082.59	€ 1,082.59	€ 1,082.59	€ 1,082.59	€ 1,082.59	€ 1,082.59	€ 1,082.59
EBT	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)
Taxes 25%	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Net Profit	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)	€ (16,058.83)
Net Profit %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

V. Cash flow Statement First Six Months Detail Projection

2020 Six Month Details Until December 31st

Year 2020	June	July	August	September	October	November	December
Initial Cash	€ 155,000.00	€ 146,701.88	€ 138,403.76	€ 130,105.64	€ 121,807.52	€ 113,509.40	€ 105,211.28
Inflow							
Sales	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Total inflow	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Outflow							
Expenses							
Administrative and Marketing							
Expenses	€ 180.00	€ 180.00	€ 180.00	€ 180.00	€ 180.00	€ 180.00	€ 180.00
Wages	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00	€ 4,800.00
Utilities	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00
Depreciation	€ 38.58	€ 38.58	€ 38.58	€ 38.58	€ 38.58	€ 38.58	€ 38.58
Other	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00	€ 2,000.00
Loan and Interest							
Expenses	€ 1,079.54	€ 1,079.54	€ 1,079.54	€ 1,079.54	€ 1,079.54	€ 1,079.54	€ 1,079.54
Total Outflow	€ 8,298.12	€ 8,298.12	€ 8,298.12	€ 8,298.12	€ 8,298.12	€ 8,298.12	€ 8,298.12
Ending							
Balance	€ 146,701.88	€ 138,403.76	€ 130,105.64	€ 121,807.52	€ 113,509.40	€ 105,211.28	€ 96,913.16

VI. Balance Sheet 6 Year Forecast

Balance Sheet 6 Year Projection

Assets						
Year	2021	2022	2023	2024	2025	2026
Current Assets						
Cash	€ 93,983.76	€ 134,406.27	€ 180,212.77	€ 231,941.68	€ 290,185.23	€ 355,594.88
Accounts Receivables	€ 16,438.36	€ 18,082.19	€ 19,890.41	€ 21,879.45	€ 24,067.40	€ 26,474.14
Non Current Assets						
Depreciation	€ 463.00	€ 463.00	€ 463.00	€ 463.00	€ 463.00	€ 463.00
Net Fix Assets	€ 2,083.50	€ (463.00)	€ (463.00)	€ (463.00)	€ (463.00)	€ 12,491.49
Total Assets	€ 110,422.11	€ 152,488.46	€ 200,103.18	€ 253,821.13	€ 314,252.63	€ 382,069.02
Liabilities & Owner's Equity						
Year	2021	2022	2023	2024	2025	2026
Current Liabilities						
Accounts Payable	€ 463.00	€ 463.00	€ 463.00	€ 463.00	€ 463.00	€ 463.00
Non Current Liabilities						
Long term debt	€ 60,828.25	€ 49,394.47	€ 37,674.84	€ 25,662.21	€ 13,349.28	€ 728.52
Total Liabilities	€ 61,291.25	€ 49,857.47	€ 38,137.84	€ 26,125.21	€ 13,812.28	€ 1,191.52
Total Equity	€ 49,130.86	€ 102,630.99	€ 161,965.35	€ 227,695.92	€ 300,440.35	€ 380,877.50
Total Liabilities + Shareholders Equity	€ 110,422.11	€ 152,488.46	€ 200,103.18	€ 253,821.13	€ 314,252.63	€ 382,069.02

VII. Income Statement 6 Year Forecast

Income Statement 6 Year Projection

Year	2020	2021	2022	2023	2024	2025	2026
Sales	€ -	€ 200,000.00	€ 220,000.00	€ 242,000.00	€ 266,200.00	€ 292,820.00	€ 322,102.00
Production							
Expenses	€ 60,000.00	€ 12,000.00	€ 12,000.00	€ 12,000.00	€ 12,000.00	€ 12,000.00	€ 12,000.00
Gross Margin	€ (60,000.00)	€ 188,000.00	€ 208,000.00	€ 230,000.00	€ 254,200.00	€ 280,820.00	€ 310,102.00
Gross Margin %	0.00%	94.00%	94.55%	95.04%	95.49%	95.90%	96.27%
Expenses							
Wages	€ 33,600.00	€ 117,600.00	€ 129,360.00	€ 142,296.00	€ 156,525.60	€ 172,178.16	€ 189,395.98
Administrative and Marketing							
Expenses	€ 1,260.00	€ 2,160.00	€ 2,376.00	€ 2,613.60	€ 2,874.96	€ 3,162.46	€ 3,478.70
Depreciation	€ 270.06	€ 463.00	€ 463.00	€ 463.00	€ 463.00	€ 463.00	€ 463.00
Utilities	€ 1,400.00	€ 2,400.00	€ 2,640.00	€ 2,904.00	€ 3,194.40	€ 3,513.84	€ 3,865.22
Other	€ 14,000.00	€ 24,000.00	€ 26,400.00	€ 29,040.00	€ 31,944.00	€ 35,138.40	€ 38,652.24
Total							
Expenses	€ 50,260.00	€ 146,160.00	€ 160,776.00	€ 176,853.60	€ 194,538.96	€ 213,992.86	€ 235,392.14
EBITDA	€ (110,260.00)	€ 41,840.00	€ 47,224.00	€ 53,146.40	€ 59,661.04	€ 66,827.14	€ 74,709.86
EBIT	€ (109,989.94)	€ 42,303.00	€ 47,687.00	€ 53,609.40	€ 60,124.04	€ 67,290.14	€ 75,172.86
Interest							
Expenses	€ 7,578.13	€ 6,495.54	€ 5,412.95	€ 11,908.49	€ 17,321.44	€ 21,651.80	€ 32,477.70
EBT	€ (102,411.81)	€ 35,807.46	€ 42,274.05	€ 41,700.91	€ 42,802.60	€ 45,638.34	€ 42,695.16
Taxes 25%	€ -	€ 6,989.88	€ 8,335.88	€ 9,816.48	€ 11,445.14	€ 13,236.66	€ 15,207.34
Net Profit	€ (102,411.81)	€ 28,817.58	€ 33,938.17	€ 31,884.43	€ 31,357.46	€ 32,401.68	€ 27,487.82
Net Profit %	0.00%	14.41%	15.43%	13.18%	11.78%	11.07%	8.53%

VIII. Cash Flow Statement 6 Year Forecast

Cash Flow 6 Year Projection

Year	2020	2021	2022	2023	2024	2025	2026
Initial Cash	€ 155,000.00	€ 96,913.16	€ 137,335.67	€ 183,142.18	€ 234,871.09	€ 293,114.64	€ 358,524.29
Inflow							
Sales	€ -	€ 200,000.00	€ 220,000.00	€ 242,000.00	€ 266,200.00	€ 292,820.00	€ 322,102.00
Total inflow	€ -	€ 200,000.00	€ 220,000.00	€ 242,000.00	€ 266,200.00	€ 292,820.00	€ 322,102.00
Outflow							
Expenses							
Administrative and Marketing Expenses	€ 1,260.00	€ 2,160.00	€ 2,376.00	€ 2,613.60	€ 2,874.96	€ 3,162.46	€ 3,478.70
Wages	€ 33,600.00	€ 117,600.00	€ 129,360.00	€ 142,296.00	€ 156,525.60	€ 172,178.16	€ 189,395.98
Utilities	€ 1,400.00	€ 2,400.00	€ 2,640.00	€ 2,904.00	€ 3,194.40	€ 3,513.84	€ 3,865.22
Depreciation	€ 270.06	€ 463.00	€ 463.00	€ 463.00	€ 463.00	€ 463.00	€ 463.00
Other	€ 14,000.00	€ 24,000.00	€ 26,400.00	€ 29,040.00	€ 31,944.00	€ 35,138.40	€ 38,652.24
Loan and Interest Expenses	€ 7,556.78	€ 12,954.49	€ 12,954.49	€ 12,954.49	€ 12,954.49	€ 12,954.49	€ 12,954.49
Total Outflow	€ 58,086.84	€ 159,577.49	€ 174,193.49	€ 190,271.09	€ 207,956.45	€ 227,410.35	€ 248,809.63
Ending Balance							
Balance	€ 96,913.16	€ 137,335.67	€ 183,142.18	€ 234,871.09	€ 293,114.64	€ 358,524.29	€ 431,816.66

IX. Loan Payment

Payment Loan per year

	Cash			Outstanding
	Payment	Interest Expense	Repayment	Balance
0				€ 61,000.00
1	€ 1,082.59	€ 127.08	€ 955.51	€ 60,044.49
2	€ 1,082.59	€ 125.09	€ 957.50	€ 59,087.00
3	€ 1,082.59	€ 123.10	€ 959.49	€ 58,127.51
4	€ 1,082.59	€ 121.10	€ 961.49	€ 57,166.02
5	€ 1,082.59	€ 119.10	€ 963.49	€ 56,202.52
6	€ 1,082.59	€ 117.09	€ 965.50	€ 55,237.02

X. 6 Year Projection Ratios

Ratios

	2021	2022	2023	2024	2025	2026
ROE	23.04%	29.90%	38.61%	49.82%	64.50%	84.15%
ROA	14.16%	17.89%	22.41%	27.89%	34.59%	42.85%
Debt ratio	0.4	0.42	0.44	0.46	0.48	0.51
Assets turnover	1.35	1.58	1.84	2.16	2.55	3.03