BlindSight - Business Plan

January 14, 2024

Contents

Chapter 1

Abstract

Inspired from one of the United Nations Sustainable Goals[1], namely Goal 10: Reduced Inequalities, BlindSight seeks to elevate the capabilities of the visually-impaired in our modern-day society. The company will focus on providing a feature-rich, yet affordable solution in the aims of growing quickly and helping as many people as possible. The impact of BlindSight's efforts will simultaneously bolster the economy as the visually-impaired benefitting from this technology will become more independent, thus more productive in their lives.

By utilizing the latest advances in AI technology and the widely-available smartphones, BlindSight aims to tackle the market for affordable assistive technologies which still has untapped potential. Through its efforts, the company hopes to bring benefit not only to the visually-impaired but also to the people around them and to society as a whole.

[1] https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Chapter 2

Introduction

The following report aims to identify the target market and to analyze the current players. Furthermore, product details of BlindSight's upcoming project will be explored as well as implementation details and feature descriptions.

Moreover, BlindSight's potential role in the market will be covered as well as an approximate project timeline. Attached the reader should find a spreadsheet of the financial projections for the company.

Chapter 3

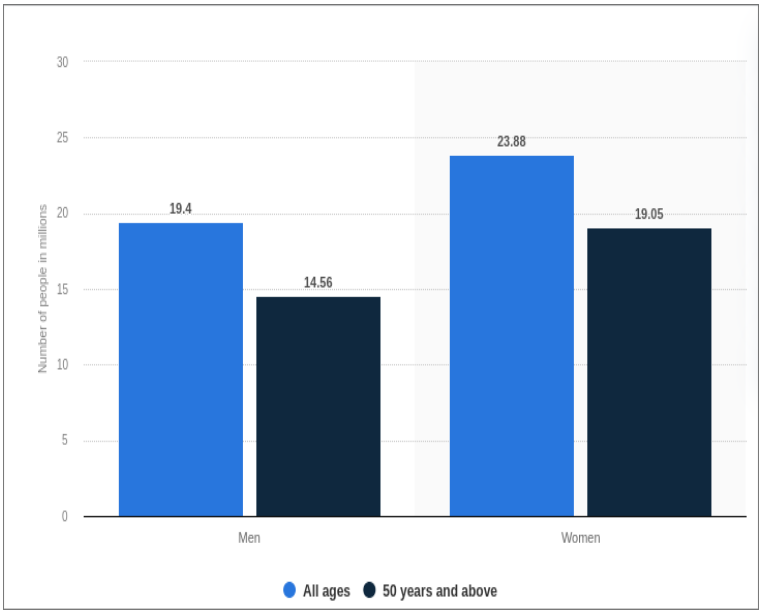
Market Analysis

The target market of our product mainly consists of individuals who are considered legally blind, i.e. people whose vision cannot be corrected to 20/20 with traditional visual aids[1]. Furthermore, our outreach can extend to those who are visually impaired to such an extent that they are inept at accomplishing everyday tasks independently. According to the 2018 National Health Survey[2], 32.2 million American adults report suffering from significant vision loss.

Globally, Statista reports that there are a total of 43.28 million who are considered blind[3]. The majority of the target market is aged 50 years or older (they account for roughly 78% of all blind people). Older people are disadvantaged by a plethora of age-related factors such as slower reaction time[4]. Coupled with the loss of vision, an elder person is rather vulnerable to external dangers, from crossing the road to tripping over a pot-hole in the ground. Moreover, there are many cases of poorly thought-out infrastructure which is inaccessible for those without vision. Navigation is essential for everyday work and it sub-consciously adds to our perception of self-worth. The absence to roam independently could lead to feelings of anxiety, which could further spiral to other insecurities.

[1] https://www.allaboutvision.com/conditions/lowvision/visual-impairment/
[2] https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment
[3] https://www.statista.com/statistics/1237876/number-blindness-by-age-gender/
[4] https://www.health.harvard.edu/blog/my-fall-last-fall-201603149311

Figure 3.1: A graphic from Statista showing the number of visually impaired people in the millions.



It is estimated that in geographical Europe the number of people experiencing visual impairment exceeds 30,000,000 (with 3 million of those being diagnosed with blindness)[5]. What is more troubling is the unemployment rate of such persons (that are of working age) is over 75%. It is clear that an affordable solution is needed to help such high rates.

Yet another factor to consider is all the resource that go in supporting people with vision loss. The WHO estimates that the financial burden of vision loss tallies to US$ 411 billion[6]. The high price tag can be attributed to not only the costs of supporting blind people, but also the loss of productivity due to the disability.

The final problem our product seeks to tackle is the difficulty many visually impaired people face when trying to read a text, or more generally when they interact with objects. While solutions for making written text accessible to the target market do exist, they are either limited in number or rather hard to acquire. Braille books, for example, are more costly than their non-braille counterparts as they are more costly to produce[7]. It must be acknowledged that devices such as reading pens aim to fix this issue, however they are not

[5] https://www.euroblind.org/about-blindness-and-partial-sight/facts-and-figures
[6] https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment
[7] https://www.tckpublishing.com/braille-books/

without their cons. Namely, they are skill-dependent; their accuracy depends heavily on the user's ability to move the pain reliably without too much shaking. Moreover, these pens are ineffective when it comes to reading street signs and other similar forms of written communication[8]. The internet, an alternate source of information and entertainment, can be similarly inaccessible to visually impaired people, as the interface of most webpages rely heavily on sight. What makes things worse is that it is not uncommon for developers to neglect the accessibility aspect of their web app. This leaves our target audience with a lackluster selection of sources with which they can educate and entertain themselves. The lack of vision furthermore hinders object interaction. People living with blind people have to be extremely careful to leave everything in its rightful place, otherwise the blind person would be unable to navigate comfortably inside their own home[9].

The sizeable population with impaired vision is severely disadvantaged in today's world, and their disability afflicts heavy losses to the global economy. Meanwhile, the current solutions on the market are not suitable for all the complex needs of our target market. Clearly, the market is in need of a brand new, innovative product that will alleviate the weight that blindness imposes on society.

SWOT Analysis

Strengths

The key to BlindSight's success will depend on the company's ability to provide the users of the product with at least as many features our competitors for a fraction of the cost. Our product will focus on improving the way that the visually impaired navigate and interact with their surroundings with the use of the Blindsight mobile app. For cutting-edge navigational and interactive assistive technology BlindSight will offer an extension set which will include bracelets, whose haptic feedback will decrease the reaction time that the user's need to respond to any oncoming dangers. Furthermore, the bracelets can make use of the haptic feedback to signal to the user how close their hand is to a previously-specified object. This feature will aid the visually impaired in interacting with their environment. All of these functionalities and more will be available along with features already offered by BlindSight's competitors.

The main selling point of BlindSight will be its extremely competitive subscription fee (it will be less than 1% of the price that competitors offering similar features are charging).

Yet another advantage that BlindSight has over most other competitors is that

[8] https://smarterlearningguide.com/reader-pens-for-dyslexia-are-they-right-for-your-child/
[9] https://wecapable.com/problems-faced-by-blind-people/

the product will not require any expensive hardware for basic use cases. All that will be needed for basic functionality is a phone app, which will be widely accessible due to the abundance of smartphone users globally. The accessibility of BlindSight's plethora of features, coupled with its affordable subscription price and its ease of accessibility make the product exceptionally competitive in a budding and an untapped market.

Weaknesses

It must be mentioned that BlindSight is new to the market and its competitors have a head start in R&D as well as in brand recognition. However, due to BlindSight sharing some of the same strengths as the other market players (be that the many features that it offers, its wide availability, or simply the low price) the company is poised for success as the blueprint has been proven to work as evidenced by companies such as Envision.

The lack of immediate capital of BlindSight will force the company to expand slower at the start. However, once the mobile app has released to production and there is a steady stream of capital this issue will be solved.

Opportunities

BlindSight has a unique shot at cornering an area of the market that is lackluster as of now, namely targeting the users who cannot afford the feature-full premiums of some of the competitors. Furthermore, one of BlindSight's core features is its network which will allow friends, family and emergency services to know the whereabouts of the user in case of any mishap. Additionally, BlindSight's bracelets from the extension set will guide the users as to which way to turn in case of an approaching danger. This solution will be far more effective in increasing the reaction time than a simple voice message.

Finally, BlindSight's myriad of features will aid the visually impaired in more tasks throughout their day in a quicker, more user-friendly way. This will be possible via the BlindSight extension set which will consist of vibrator bracelets and smart glasses.

Threats

BlindSight's challenges that it must overcome in order to secure a foothold in the market are few, and it is imperative that they be addressed. First off, once the extension set is made available to the public a repair team should be available in the case of any needed repairs to the hardware models. To combat this roadblock BlindSight will outsource the repairs as it save the company from having to hire workers and rent out offices. Where technical team is necessary to deal with malfunctioning units, a legal and accounting services will be needed

to establish BlindSight's image as trustworthy. Hence, BlindSight plans on acquiring such services through consulting firms.

The second obstacle that BlindSight faces is the reliance on an artificial intelligence model to determine the appropriate action that a user should undertake. It has become abundantly clear over the past year that AI models are far from perfect, hence actions must be taken to mitigate such risks that stem from BlindSight's reliance on such technologies. For instance, after the prototyping stage is deemed successful, the BlindSight team aims to train its own model that will be optimized to provide the user's with the most accurate information possible. In order to verify that such measures are successful BlindSight's product will be rigorously tested in different situations and any inadequacies will be dealt with.

Chapter 4

Competitor Analysis

With the rising popularity and prominence of artificial intelligence, it is expected that it could be used to tackle obstacles such as disabilities. However, the market for blindness-assisting technologies remains fairly unsaturated. Nevertheless, the few noteworthy products listed below have a relatively good track record and are rapidly evolving. Despite this, there are some gaping holes still left unfilled, which BlindSight could provide a solution for.

4.1 Competitor 1: Envision

Envision website: https://letsenvision.com/

A product with such a wide array of features such as Envision will surely be a worthy match to BlindSight. Their business offers worldwide shipping for their three models. Envision's glasses have a slick, lightweight design making them suitable for a full day's usage. The features of the Envision glasses vary based on the model:

- Envision Glasses Read Edition: Instant Text, Scan Text, Batch Scan (€2499 + Tax)
- Envision Glasses Home Edition: Instant Text, Scan Text, Batch Scan, Call an Ally, Call Aira, Describe Scene, Detect Light, Recognize Cash, Detect Colors, Find People, Find Objects, Teach a Face and Explore (€3499 + Tax)
- Envision Glasses Professional Edition: Instant Text, Scan Text, Batch Scan, Call an Ally, Call Aira, Describe Scene, Detect Light, Recognize Cash, Detect Colors, Find People, Find Objects, Teach a Face and Explore (€4599 + Tax)

The downside of the Envision Glasses is their premium price. The base model, the Envision Reading Edition, comes out to a hefty €2499 without tax. Being a base model, the Envision Reading Edition is missing many key features of the more expensive models; it only contains features dealing with interpreting scanned text. The subsequent model, the Envision Home Edition, possesses all the features, but it is €1000 more expensive to the Envision Reading Edition. The Envision Professional Edition, which as a reminder has the exact same features as the Envision Home Edition, will set back a buyer northwards of €4599. The concern with high prices such as these of the Envision models is that they price out many visually impaired customers out of the market. Moreover, they only come with a year's worth of warranty and for such a pricey product many potential buyers could easily be deterred by the limited coverage period. A year's worth of warranty might not provide adequate protection, especially for high-value items that could require more extensive coverage over a longer period. As for the Envision Subscription Edition, it is only available in the contiguous United States, making it inaccessible to potential consumers on the international market. Furthermore, despite the rental model saving the consumer money in the short-run, over the long-run the Envision Subscription edition could easily out-price the Home Edition and the Professional Edition. Over a two-year span, the Envision Subscription edition will have cost the consumer €3600 which would then increase to €5400 over a 3-year span. While there could be instances where one's blindness could be temporary, for many the disability will last for their entire lives. Hence, it is important that they have available an inexpensive alternative such as BlindSight that will serve to help them without putting a strain on their wallets.

Despite Envision's head start in the market, they are focused on providing a premium product which leaves the door open to an alternative that would concentrate on making such technology more accessible to the international market. The success of Envision could serve as a blueprint to BlindSight as they are a proof-of-concept that smart glasses could have a substantial impact on the lives of those living with visual impairments. Moreover, Envision's products rely on voice feedback to the user which is much slower than the haptic feedback that the BlindSight bracelets would provide on top of voice warnings. BlindSight will have all the functionality of Envision's most premium products in addition to a better danger warning system during navigation, all the while providing a product that is ten times more affordable than Envision's base model.

4.2 Competitor 2: Be My Eyes

Be My Eyes website: https://www.bemyeyes.com/

Be My Eyes is an app that helps connect visually impaired people with volunteers, who can provide aid in discerning what is in front of the blind person. The app works is by establishing a video call between the visually impaired individual and the volunteer. The volunteer can then describe what he sees in the video to the visually impaired person.
With the advent of ChatGPT-4, Be My Eyes has incorporated the AI into its product. Now, users can take a picture and record a message which is consequently transcribed to text and sent over to ChatGPT for analysis.

Be My Eyes is a rather versatile tool considering with the added bonus that it is free of charge to use. However, a drawback is that in order for the video functionality to work, a volunteer is required to be online which renders the feature unreliable. As for the ChatGPT-powered AI image detection, that is a rather arduous process for the user, who besides first opening the app, must then take a picture, record a message and only then can they send it for processing.

BlindSight's features an upgrade to the ones Be My Eyes currently has. Furthermore, BlindSight understands the importance that conducting tasks independently has on one's perception of self-worth. Hence, all of BlindSight's functionalities will be entirely reliant on AI which will always be readily available, as opposed to the unreliable factor of whether there are any volunteers available to help.

The main advantage that Be My Eyes has over BlindSight is that it is free to use. However, BlindSight's many other utilities justify its subscription fee as the features will unlock new possibilities for the users which could not be accomplished using Be My Eyes.

4.3 Competitor 3: .lumen

.lumen website: https://www.dotlumen.com/

A new competitor to the market, .lumen still does not have a product available. Their main area of focus is helping the visually impaired navigate through AI depth detection and image recognition software. Unfortunately, not much is known about the company or how much they will charge for their product.

The scarcity of information regarding the product, makes any weakness analysis purely based on speculation. It is reasonable to assume that users will be notified of any dangers by a voice assistant embedded in the headset. This can prove to be rather ineffective if the danger is fast-approaching and the user needs to react quickly. Furthermore, the headset itself looks fairly heavy and there exists a possible concern that a user will not be able to wear it for extended periods of time due to the eventual exhaustion on the neck area.

The company has not entered the marker yet, giving BlindSight an ample chance to catch up. Their product will surely require powerful processors in order to utilize the AI tool set locally. This implies that the product will most likely have a premium price, making it inaccessible to poorer consumers. Rather than fitting all the technology into one bulky and awkward headset, BlindSight will utilize the user's phone and the optional extension set to accomplish similar functionality to .lumen, all the meanwhile providing a more lightweight solution.

The company has had time to research and develop their product giving them a head start over BlindSight. The possibility that their AI will work offline and will be able to analyze the video recordings faster is an area that BlindSight could potentially rival .lumen in by hosting a less powerful AI into the mobile app, for cases where the main server is not easily reachable.

Chapter 5

Product Description

The technology behind BlindSight has been selected to provide developers with the ability to iterate fast, while providing efficient solutions to numerous problems that visually impaired individuals face in their daily lives. BlindSight's ability to move and innovate quickly will be key in developing a minimal viable product and catching up to the competition.

The ultimate goal of BlindSight is to enable blind people to achieve higher levels of independence, thereby enabling them in achieving their personal and professional goals. The technology in use can be divided into 3-sections: the hardware, the mobile app, and the backend.

5.1 The Mobile App

The mobile app will be used to communicate to the backend via web sockets. It will also host a less resource-intensive AI model to ensure that the product will function even when the server is not reachable. Another functionality of the app is that it will include geolocation services such as Google Maps as to provide navigation assistance and to allow friends, family and emergency services to know the whereabouts of the user in case of any trouble.

The app will be implemented in the Flutter framework due to the framework having a good native performance and its ability to produce multi-platform applications from a single codebase.

5.2 The Backend

The backend will be responsible for hosting the AI model and the web sockets server (implemented in NodeJS) for the mobile app. BlindSight will be using Firebase for the backend along with Google's ML Kit.

5.3 The Hardware

The hardware consists of smart glasses and a pair of bracelets equipped with vibrator motors. The smart glasses will include Bluetooth technology in order to be able to communicate the mobile app, as well as a micro camera, a microphone and a speaker. The camera will stream the video of the environment to the mobile app. The user will be able to request certain functionality via the microphone, which will also be passed to the mobile app.

Once the mobile app has returned a response the speaker will relay the information to the user. If required the bracelets will vibrate according to the need.

The hardware will be packaged and sold as an extension set, and it will release after sufficient funds have been acquired from the mobile app's subscription fees.

Figure 5.1: Overview of the BlindSight tech stack.

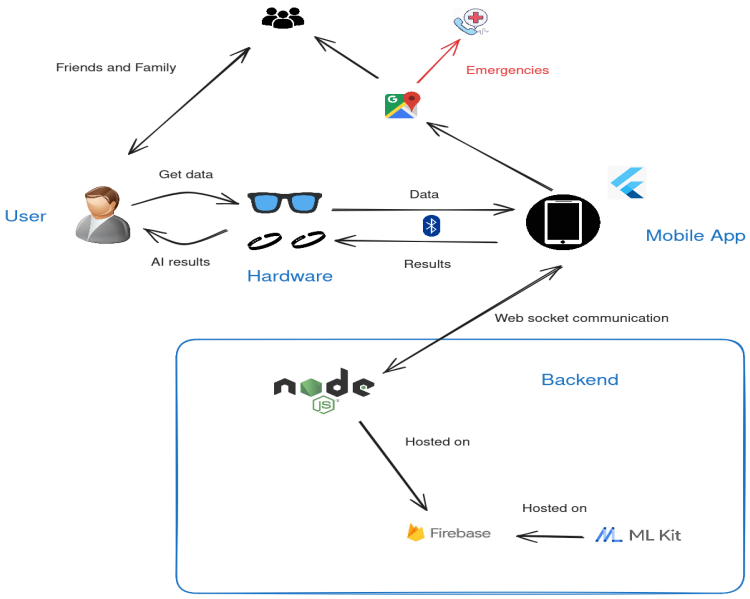
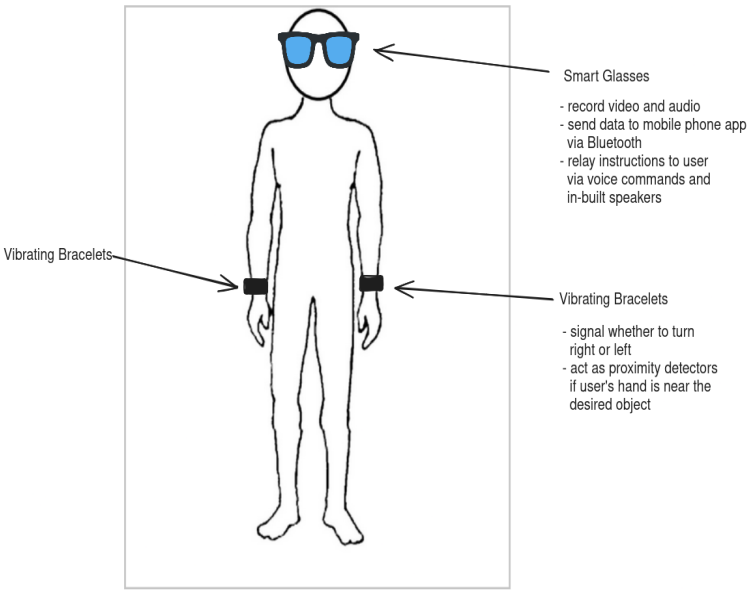


Figure 5.2: Overview of the BlindSight hardware.



Chapter 6

Product Features

BlindSight will distinguish itself from other competitors in the market by having the widest range of features. From object interaction to navigation, BlindSight will provide visually impaired individuals with the most complete package with which they can achieve their daily tasks efficiently and independently.

6.1 Mobile App Features

Monitoring and Emergency Call

Should a user be unable to avoid the danger and becomes injured, they can call for help with a simple voice command which will alert his circle of friends and family who have downloaded the mobile as well as start a call to the emergency services.

Navigation

BlindSight will utilize Google Maps to help visually impaired people navigate to their destinations safely. To select a place to go to, the user must only speak a voice command followed by the name of the destination and the instructions will be passed on to the app which will use the Google Maps API to guide the user to their destination.

Text Scanning and Translations

Should the user desire to read something, all they have to do is speak a command and whatever is in front of them will be sent to an image processing AI which will extract the text and (if needed) send it to through Google Translate for a translation before returning the result to the mobile app, which will use

text-to-speech software to relay the information back to the user. Additionally, user's will be able to specify which text they want the AI to read out (for example only the drinks section in a menu).

6.2 Extension Set Features

Danger Sense

The main selling point of BlindSight's extension set, Danger Sense will alert users of incoming obstacles and / or dangers not only via voice warnings as our other competitors do, but also with haptic feedback from the bracelets. Once an incoming danger is detected by the AI, a decision will be made in which direction the user should turn to as to avoid the approaching threat. Depending on the direction chosen the appropriate bracelet will begin to vibrate. The vibrations will increase the closer the object is to the user.

The haptic feedback will be much quicker than a voice warning as the user will know instinctively and instantly in which direction to turn. Once the user has corrected their trajectory and has escaped the danger, the bracelet will stop vibrating letting the user know he can continue in the current direction he is travelling in.

The feature will be integrated with the aforementioned Navigation capability of the BlindSight mobile app, thus upgrading the navigational capability of the product.

Object Interaction

Users will be able to find inquire for the AI to describe the environment in front of them. Then, should they want to interact with an object their command will be passed to the AI, which will then guide their hand using voice commands and the vibrations (the vibrations grow stronger the closer the user's hand gets to the object) of the appropriate bracelet to the location of the object.

The combinations of all these features will ensure that BlindSight will be able to provide users with a way to complete tasks independently, all the meanwhile keeping them safe from unexpected dangers.

Enhancements of Mobile App Features

The extension set will enhance the mobile app features by the use of the smart glasses which will be easier to carry around, as opposed to constantly holding a phone in one hand. The extension set will communicate seamlessly with the app, thus providing a more user-friendly experience.

Chapter 7

Distribution Strategy

7.1 Philosophy

BlindSight aims to empower visually impaired individuals by providing a relatively affordable technology, through which said individuals could accomplish their daily tasks in an easier and more independent manner.

7.2 Product Development

BlindSight will develop a minimum-viable product sometime in the second quarter of 2024. This will comprise a mobile application which will utilize the phone's capabilities to record video, to communicate with the AI model and to relay the instructions back to the user.

In the second half on 2024, after getting feedback on the prototype, BlindSight will focus on developing the extension set necessary to elevate the company above the competition. The company will have a fully operational model sometime in 2025.

7.3 Distribution

BlindSight will get in touch with optometry and ophthalmology clinics in order to test the progress with individuals who are visually impaired. Once the minimum-viable product is ready, BlindSight will rely on optometrists recommending the app to the target market. At this stage the app will be in beta, and it will be free for the users. The cooperating optometrists will receive a special affiliate code which will grant them 15% of the subscription fees paid by any users that use the said code.

At the same time, BlindSight will seek to be an official partner of non-profit

organizations seeking to provide aid to the visually impaired. BlindSight will offer package deals to such organizations and in turn the product will establish itself as the accessible, go-to product for assistive technologies for the blind. One possible such package could be a 3-month free subscription to the mobile app once it reaches the production stage.

Additionally, once the extension set has become available for purchase BlindSight could rent out an amount of extension sets to these non-profits based on the amount of new subscriptions these organizations attract.

7.4 Sales

BlindSight will initially focus on affordable monthly subscription fees to finance further development of the extension set. The strategy here is to evaluate the interest of the market for a more affordable solution, all the while minimizing initial capital needed to launch the company off the ground. A similar business model has been proven to be effective by Envision, however in order to reel more users in, BlindSight's subscription will be more affordable (approximately €5 per month).

Moreover, BlindSight's extension set will sell for €499 (a substantially lower price than Envision's base model price of €2499 pre-tax).

7.5 Goals

1. Release the mobile app as beta to users through our affiliations by the end of the second quarter of 2024.
2. Develop a prototype of the extension set by the end of the third quarter of 2024.
3. Complete transition of mobile app to production and begin monetization by the end of 2024.
4. Release the extension set for purchase at the end of the 1st quarter of 2025.

Chapter 8

Financial Projections

In 2024, BlindSight's focus will be on developing a production-ready mobile application. Hence, the only projected costs will be those of the server on which the AI model will be hosted on.

Once the app has reached production-ready status it will be released as a subscription-based mobile app on the Apple App Store and on Google Play. After the extension set has been developed and sufficient funding from the subscription fees has been acquired, BlindSight will begin the manufacture and the consequent distribution of the extension set.

For more details please reference the accompanying spreadsheet.

Chapter 9

Conclusion

After analyzing the state of the market it is clear that there is potential in providing an affordable solution. This is a need that BlindSight seeks to cover in the following years by first gauging the market with a mobile application before releasing a hardware extension set which will revolutionize the way the blind interact with the world around them.

BlindSight's many features will not only encompass those of other competitors, but they will also be enhanced as to provide a higher quality experience to the user.

BlindSight's products will be vigorously tested before launching to the public, as the company is aware that the user's trust will be invaluable in order to grow. To facilitate such growth, BlindSight will try to minimize expenses until funds from the mobile application's subscription fees has accumulated before investing in the release of the hardware extension set which will propel the company's product beyond anything currently available on the market today.