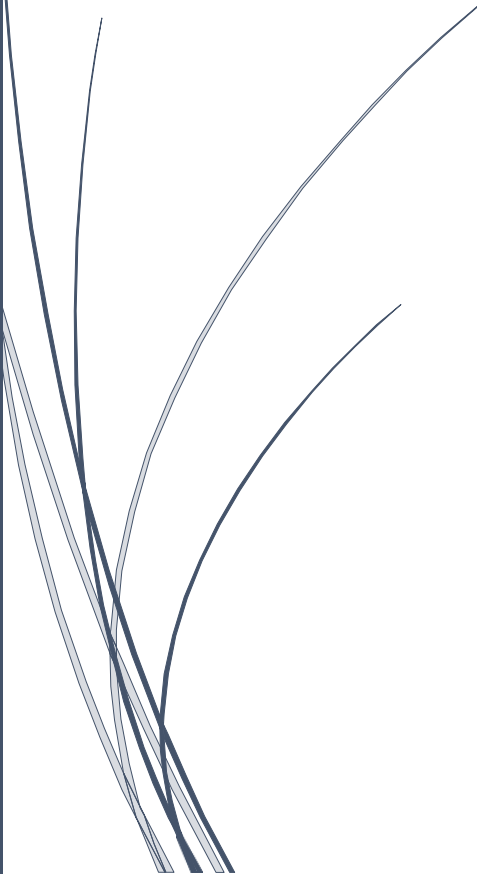# Object Detection and Facial Recognition for the Blind (NavVis)

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Executive Summary:

Eyes are one of the greatest gifts from God. However, there are people who do not have the gift of sight or have lost it. Our product NavVis (Navigational Vision) aims to solve some of the problems faced by these people. People who are legally blind have sight but it is so weak that they have to stand very close to that object, even then some people cannot see things. People who are totally blind have never had light enter their eyes. Our product provides them with a way with which they can walk around and have some form of independence.

Our product works by actively classifying and recognizing objects in a person's surrounding and alerts the users via ear buds if any obstacle is lying in the user's path.

Since, this is a kind product there are currently no other company providing this kind of product or service in Pakistan.

We aim to use all forms of media from print to social to television for the promotion of our product. For distribution purposes we will have sale points all over the country where the customers can come and test the product themselves.

For the funding purposes we wish to take loans from a bank, get help from interested investors like venture capitalists and also appeal to the human nature of people and ask them for donations.

Business Description

Our business is a Limited Liability Partnership (LLP). Partnership among my partners.

Mission Statement:

NavVis is the product for the blind who have lost sight of the light, providing independence and navigation during their daily lives. Unlike any glasses before, it provides real time navigation for totally blind people to move around freely.

Product/Service Description:

The problem that we are trying to cater is that blind people have hard time moving around. Many companies offer glasses for the legally blind or people with visual impairment, but they either cater to only one problem like improving vision, or detecting objects but not both or they are very expensive and out of the reach of the population. The problems faced by blind people are multiple. Too often we have seen blind people walking around with sticks and feeling out what is lying ahead of them.

The solution that we are providing to the customers is very similar to the glasses provided by other companies, but we are providing it at a lower cost and we are using a different method of viewing. The glasses provide both facial recognition and object detection.

Features:

- Object detection while crossing the streets, alerting user to any oncoming traffic, or traffic from any direction and obstacle lying in the path.

- Alerting the user if any person is approaching them. The facial recognition process is ongoing at all times. The faces of friends and relatives are can be saved in the onboard storage module.

- Machine learning for training on localized areas and vehicles.

After Sale Services

After the sale there is a 3-month warranty and training course for the person and his relatives so as to familiarize them with the workings of our product. In the future we plan to attempt to be able to help the totally blind see the light without the use of surgery. We plan to connect these glasses with the visual receptors of the brain and attempt to provide patients with bionic eyes. We have plans to employ ophthalmologists and try to link these glasses with the brain just like bionic limbs.

Industry Analysis
Key Success Factors for Business

- This product is the first of its kind in Pakistan.

- The benefits outweigh the cost of the product.

- A beneficial solution without the expensive eye surgery.

- Humanitarian based product.

Industry Profitability (with reference to Pakistan)

With respect to the industry in Pakistan, we are confident we can turn up a profit. Although, the percentage of blind people in Pakistan is relatively low, we plan on expanding overseas if we succeed here. Since, we have mentioned there are currently no such products available in the Pakistani product and with the benefit of helping people who cannot be cured with surgery we are hopeful that we will be able to turn a profit beneficial for our company.

Identify key players in the market

The key player in the market for our product are the ad agencies. The success of our product is dependent on how many people are exposed to the visuals of our products. We are framing a reasonable price so as to entice people from lower sections of the economic ladder to approach us and utilize our product.

Market Segmentation and Target Market Selection

Competitor Analysis

No company is providing this product and service in Pakistan. We are the first company to launch such a product into Pakistani market.

Who are our customers? Their number and kind.

1. The main target market are people who are totally blind, as they have no sense of the world around them. They will make up for 60% our market.
2. The remaining market will be occupied by the people who are legally blind.

According to a report by WHO the number of totally blind will go up as blindness is mostly caused by preventable or curable diseases, but 90% of the blind population lives in developing countries. Of the total blind population 18% are totally blind.

How often do they purchase your product/service?

Project is yet to launch.

Marketing Strategy

Pricing strategy and reason why you choose this strategy?

Our Pricing strategy is value-based strategy. We choose this strategy because since no one else is providing this service. The value of our product will be based on customer reviews

The main costs for this product will be from:

- The motherboard and storage drive used for the software and data storage

- The nano camera modules

- The rental cost of servers per month

The rental cost of the servers will be covered within the revenue that we shall generate.

- We plan to place our products at $1300 (approx. Rs. 200,000) and will be available only for the totally blind people.

- The price for legally blind people will be around $1800 (approx. Rs. 270,000).

We also plan to provide this product at a discount for people who cannot afford this product. For this matter we will ask for income documentation and place them on a list. Each person will be individually priced according to their income.

Methods of selling

- **Direct Selling:** We plan to handle customers as they come to our sale points.

- **Earned Media:** Newspaper articles and editorials will also be employed.

- **Word of mouth advertising:** We wish to use our friends and family members to spread word about our product.

Distribution Channel

We plan to cater directly to customers at our sales point. This is so that they and whoever they come with can test them and see for themselves how the glasses work. We also plan to teach the user and guest how the product works and how they can use it effectively. Doing this removes the doubt of whether the products will work or not and reduces the chances of a product being returned.

Placement of your product/Service

We are planning on showcasing demos of our product in some upcoming television series.

Promotion Plan

- Every customer which walks in will be given a hands-on trial at the sales point.

- We will ask trusted friends and family members to promote our product in their respective industries and institutes.

- We plan to hold product demonstrations in different shows and seminars.

Management Team

Organizational Chart (Who will do what in your organization)

To develop these smart glasses, our team will have 3 main management branches. One for developing side, another to overlook finance and one to handle advertisement and bring awareness of our product in market. Furthermore, we will have to hire an electrical engineer who will develop the physical side of the glasses.

Managerial Team:

- Muhammad Zain – Development Manager

  - **Education:** A BSCS student from FAST-NU.

  - **Background:** He is talented and quite skilled in developing software. Despite of lacking experience he shows some extra-ordinary skills that can fill his experience gap.

  - **Duties and Responsibilities:** He will be responsible for developing the software side of the product and will look over the physical side of developing. Another thing he will do will be the he will consistently try to improve his model of image classification for better efficiency of glasses.

- Shamon Shahid– Finance Manager

  - **Education:** A BSCS Student from FAST-NU.

  - **Background:** He has excellent mathematical and analytical skills also has the capacity to make quick but rational decisions. He has all the skills required for his position that includes Analytical Thought, Accounting Skills etc.

- **Duties and Responsibilities:** He will handle the finance of company and due to his past in CS field he will also be responsible for developing the system architect and design the model which will be followed by the electrical engineer.

- Yasir and Hasnain – Marketing Manager

  - **Education:** He is also a BSCS student from FAST-NU.

  - **Background:** He is fluent in English and have great presentation skill who have taken part in multiple debates. He has confident like no other and know how to convince people of something. As the most important requirement for a product to gain success in market is marketing and to bring awareness among the people as no matter how much good your product will be, if people don't know about it then it will never be bought. This will bring failure to business.

  - **Duties and Responsibilities:** Yasir will bring awareness among the people and the medical field by going at seminars.

Staff:

- Muhammad Waleed – Electrical Engineer

  - **Education:** He is a BSEE student from UET.

  - **Background:** He is skilled in developing products like, RC car or RC plane and was very enthusiastic about helping us with developing the glasses when he heard about our product.

  - **Duties and Responsibilities:** He will develop and maintain the physical side of product.

Company Structure:

The company is co-founded by us three friend and all us hold equal share and responsibility of our product.

Muhammad Zain DEVELOPM	Shamon Shahid FINANCE	Yasir & Hasnain MARKETING
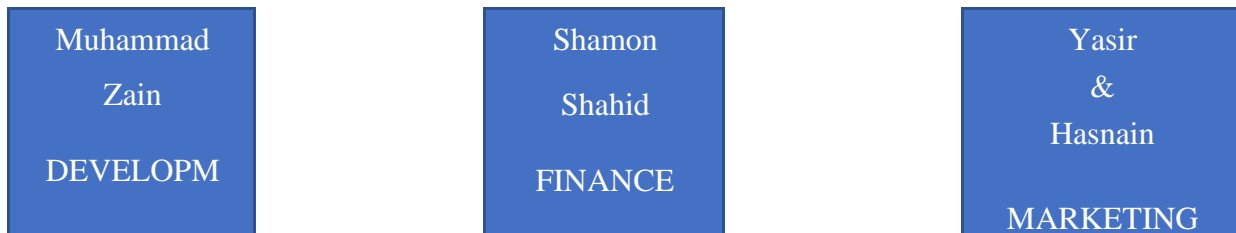
In future we plan to expand our team and give one task to each individual. Like hiring a separate data scientist for working on model and a proper software developer to work on software. We also intend to hire two different people to work on advertisement who will work under Yasir, one will work on social media and other one will work by going on meeting and live platform to show people the type of product we are bringing to market. As the company is co-founded, we will hire or select a CEO from us for smooth running of company. He will answer to the board of director (the three co-founder) for any kind of issue company faces under his management.

Product/Service Development Plan (in case if you develop it)

As mentioned above we plan to use the real time object classification and identification technology similar to the one Tesla uses in their auto driving cars. The components will come pre-equipped with the classification of data or areas outside the house. However, whenever the glasses are being used when connected to Wi-Fi, it will communicate with our servers. This will divide the processing

Financial Projections

How much money is needed?

Acquisition of Funds

Sr No.	Source of Funds	Funds Expected
1	Venture Capitalist	$8000
2	Crowd Funding	$5000
3	Bank Loan	$2000

Allocation of funds

	Annual	Monthly	
Housing & Utilities	$11,400	$950	13.29% of income
Transportation	$2,710	$226	3.16% of income
Living Expenses	$2,880	$240	3.36% of income
Food & Meals Out	$2,040	$170	2.38% of income Part of the living expense
Debt & Loan Payments	$9,600	$800	11.19% of income Mortgage and auto loan included

Expenses Breakdown
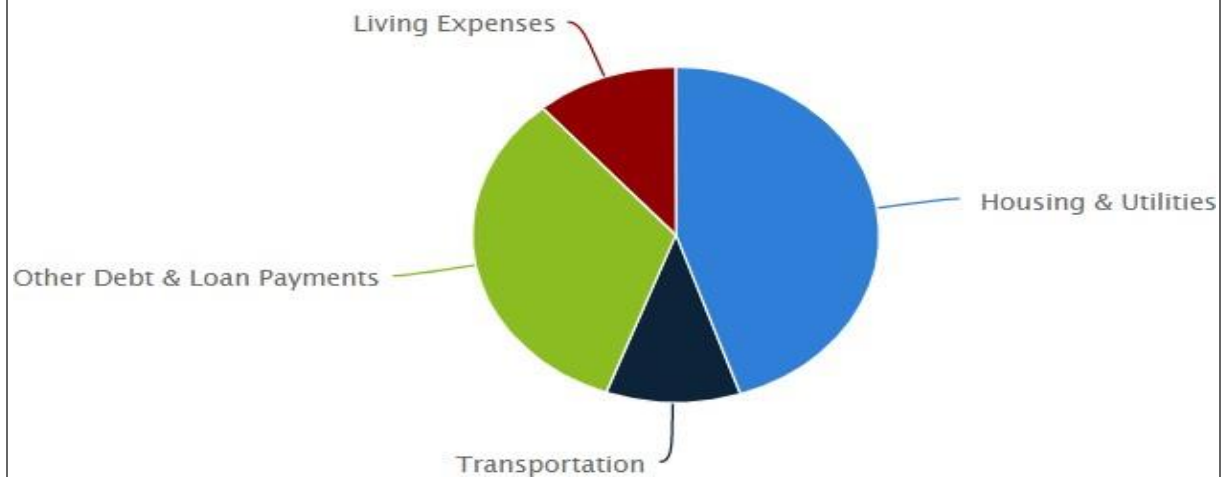
Start-up Costs

- We planned to obtained most funds for our business is from venture capitalist. We plan to find those venture capitalists who find interest in our project and provide funds to us for startup.

- Another main source for our funds will be crowd funding, we plan to demonstrate our idea and product to people from where interested people can fund us. This can be encouraged by giving some exclusive discounts to funders on release of product

- It is planned that we will get loan from bank for our startup. We don't plan to get high loan from bank because of their high interest. This method is least favored by us and will only be done on dire situations.

Development Costs

- Office Setup cost will increase due to the increase in the staff

- Rent is increased 10% each year.

- Utilities and Bills are increased 10% every year.

- Advertisement Cost will decrease annually because our product would have been launched and does not require same promotions.

- Average salary is 40,000 per month and staff is increasing as per growth in the business on a yearly basis.

- New equipment's would be required to develop the product, hardware like cameras for glasses or frames of glasses etc.

- Cost would be required for the research department; this cost will decrease annually.

Break-even Analysis

Applying an interest rate of 8% yearly, we will be able to break even in 3 year and our bank loan will be paid off.

## Cash Flow statement Projection for 2 Years

Year 1	Annual	Monthly
Total Before Tax Income	$132,000	$11,000
Total After Tax Income	$85,800	$7,150
Total Expenses	$25,390	$2,116
Net (Discretionary Income)	**$60,410**	**$5,034**
	Year 2	
Total Before Tax Income	**$369,000**	
Total After Tax Income	**$257,400**	
Total Expenses	**$76,176**	
Net (Discretionary Income)	**$181,224**	

Projected Income Statement for 2 years

Year 1	Sales	Year 2	Sales
January	$8000	January	$10524
February	$7200	February	$9325
March	$8024	March	$11255
April	$8411	April	$9922
May	$7643	May	$11142
June	$9765	June	$9523
July	$8751	July	$10324
August	$7654	August	$17562
September	$8654	September	$18543
October	$9755	October	$11875
November	$8721	November	$10422
December	$7612	December	$10232

Projected Balance Sheet for 2 years

Net Profit (3 years)
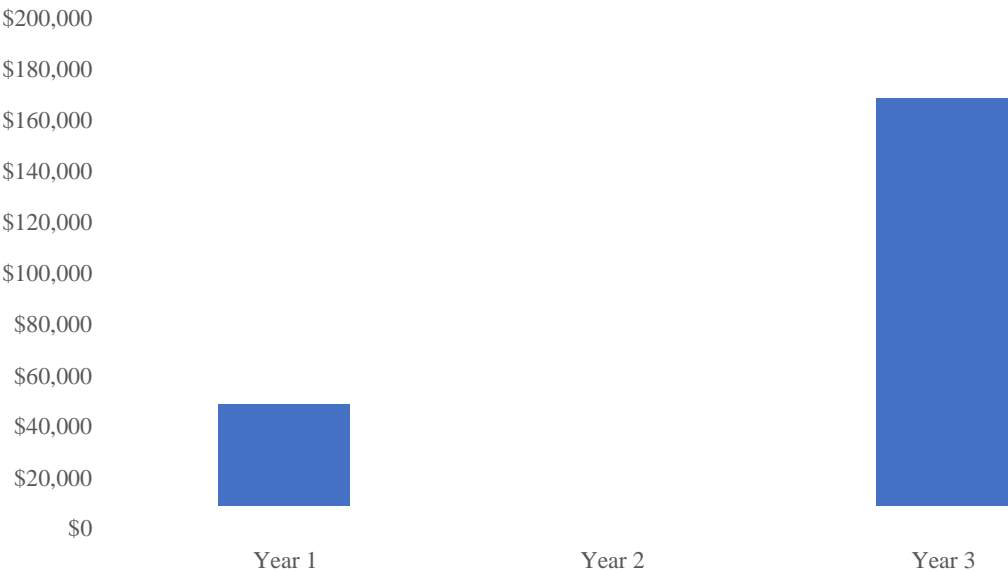
Ratio Calculations

DTI Ratio	**13.64%**	Your DTI ratio is good.
Front-End DTI Ratio	**6.36%**	housing costs by gross income

Business Risks, your plan for risks

The risk and assumption we are taking in launching this product is that people will want to buy our product. We have done our surveys and people will support the launch of such a product. However, it is difficult to gauge the success of such a product because it is the first of its kinds in Pakistan.

Exit Strategy

Our exit strategy is liquidation and closed. If our product fails to capture the market, we planned to sell our assets and close the company.

Resource Person:

Dr. Amir Ikram

Assistant Professor
Institute of Business & Management
University of Engineering & Technology, Lahore