VISION & SCOPE

1. Introduction

1.1 Purpose
The purpose of this document is to enumerate and describe high-level functionalities of the Blind Buddy Visually Impaired Navigational Assistance Application. This document focuses primarily on the functional needs of the target users, and why these needs have been chosen to be implemented in the final application.

1.2 Scope
This document pertains to the Blind Buddy Visually Impaired Navigational Assistance Application (BBVINAA), which is being developed by Team RSSF. The application will exist as a client/server system that will interface with the Mapwize indoor navigational platform, itself being built on top of Google's existing Google Maps navigational service. (BBVINAA) will provide a visually-impaired friendly user interface that will assist with the task of interior navigation. This interface will be distributed as an Android Application.

1.3 Definitions, Acronyms, and Abbreviations
BBVINAA - Blind Buddy Visually Impaired Navigational Assistance Application

UI - User Interface

1.4 References
K.E. Wiegers and J. Beatty, Software Requirements, 3rd ed., Microsoft Press, 2013. ISBN-13: 978-0735679665.

Mapwize API documentation

Google API documentation

2. Positioning

2.1 Business Opportunity
Navigation can be quite difficult for the visually impaired, especially navigating complex indoor facilities. Currently, indoor navigational systems are still in infancy. Services built on top of these systems are scarce and not well optimized. Establishing a functional and well optimized indoor navigation app in the early stages of interior navigation technology will result in higher chances of success.

Users will be able to download the application from their respective application distributor depending on their mobile platform.

The following functionalities outline what visually impaired users should expect to be able to do within the Application.

2.2 Problem Statement

The problem of	Blind people navigating indoors
Affects	Visually impaired people
The impact of which is	Blind people running into things and getting lost
A successful solution would be	A user friendly application which has a simplistic setup process, easily navigable/accessible UI, and accurate voice controls, as the main audience will be visually impaired individuals. The app must also have the ability to quickly and accurately direct the user to their desired location in their current building.

2.3 Product Position Statement

Our product will provide a cheap, easy navigation tool for the blind or otherwise visually impaired to navigate internal municipal buildings.

For	Blind or otherwise visually impaired Android owners
Who	The need for the blind to navigate internal municipal buildings
The BBVINAA	is a software product
That	Provides an easy-to-use, voice-activated solution to overcome the challenge of indoor navigation
Unlike	Other proprietary software such as Google Indoors in which the user must define and update his own maps and buy the expensive software
Our product	Is free, voice-activated and simple to use

3. Stakeholder and User Description

3.1 Market Demographic

The target users are blind or otherwise visually impaired and their potential caretakers.

The users are anticipated to be consumers who already use Android cell phones on a regular basis for personal and/or business use. Therefore, the users are assumed to understand how to use voice recognition on cell phones and recognize a basic user interface. The user is anticipated to understand the interior of buildings and the concept of rooms, stairs, and use of room numbers

3.2 Stakeholder Summary

Non-User Stakeholders

Stakeholders	Description	Responsibilities
Client	This is a stakeholder that will determine the successfulness of the final product based on the initial requirements	Provide initial requirements, feedback iteratively throughout the semester, and evaluate the final product

3.3 User Summary

Name	Description	Responsibilities	Stakeholder
Visually impaired people	This user represents the primary end user of the system	Operate app, use voice for commands, recognize spoken directions	Self
Caretaker	This user represents the assistance to the visually impaired person who is using the application	App setup help, emergency contact help, app installation	Self
Client	This user represents the measurements used to determine how capable and functional the overall app is	Produce reports, provide feedback, coordinate change requests	Self

3.4 User Environment

The user will access the app locally on their Android cell phone. No remote access will be developed for the application.

3.5 Stakeholder Profiles

3.5.1 Visually Impaired Individual

Description	An individual that will be using the application to navigate indoors
Type	This could be a casual or new user, either someone who has never used a similar navigation app or someone who has used a similar app.
Responsibilities	Use product according to primary purpose. Be able to operate application properly.
Success Criteria	The success will be defined by the customers ability to navigate the building and their continued use of our application.
Involvement	Sample customers will test the application to give their opinion on our progress and possible additions to the application.

3.5.2 Caretaker

Description	This is a stakeholder who will assist the visually impaired individual in the use of the application.
Type	This could be a casual or new user, either someone who has never used a similar navigation app or someone who has used a similar app.
Responsibilities	Assist the visually impaired stakeholder in the setup of the application. Assist the visually impaired stakeholder in the event that the "emergency contact" is called.
Success Criteria	The success will be defined by the customers ability to easily setup the app and be notified when the visually impaired user is in need of assistance.
Involvement	Sample customers will run through setting up the application given a "user profile" to assess the quality of the setup process.

3.6 Key Stakeholder or User Needs

Need	Priority	Concerns	Current Solution	Proposed Solutions
Voice Activation	High	None	Use built-in voice recognition and accessibility services provided by Android phones	Use built-in voice recognition and accessibility services provided by Android phones
Access to Internet	Moderate to High	Ability to rely on third party communication links for prompt response times	Use third party APIs and phone with Internet access to navigate	Use third party APIs and phone with Internet access to navigate
Easily accessible user interface for visually impaired	High	Ability to provide intuitive user interface	Use large, cornered buttons, as little text as possible	Use large, cornered buttons, as little text as possible

3.7 Alternatives and Competition

3.7.1: Service animal

Advantages: Trained, alert, quick response.

Disadvantages: cost of maintenance, time needed for initial training.

3.7.2: Caretaker only

Advantages: Quick response, intelligent, medically trained.

Disadvantages: cost of wages, time away for rest.

3.7.3: Cane

Advantages: affordable, lightweight, portable.

Disadvantages: accidents, unable to contact emergency services
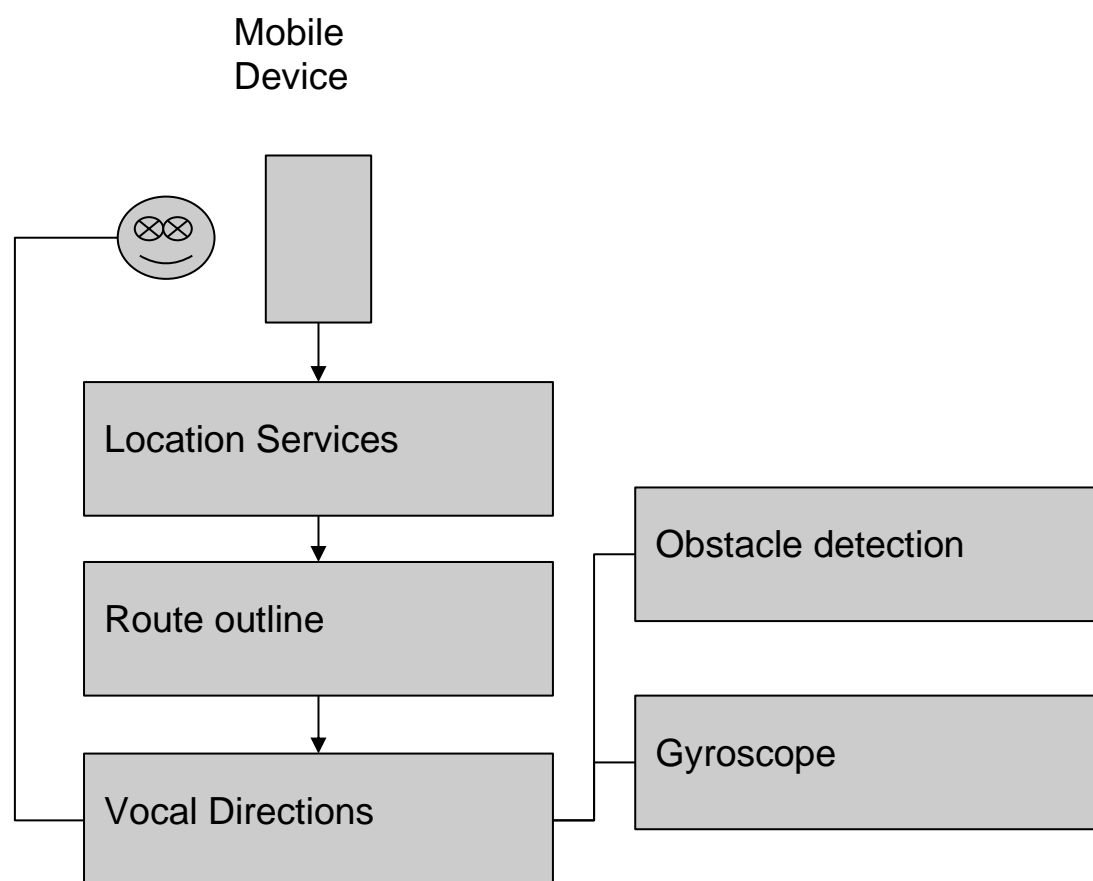
3.7.4: Google Indoors

Advantages: Existing, known to work framework

Disadvantages: Difficult to implement, expensive

4. Product Overview

4.1 Product perspective

4.2 Product functions

Customer Benefit	Supporting features
Accessible navigation instructions	Directions spoken to user to help navigate through indoor paths
Emergency contact	Stored contact information allows for quick communication in the event of an emergency
Route finder	Interpreting possible routes and determining which is the most efficient path
Fall detection	Sensing when the user falls and contacting the user's caretaker or emergency services
Obstacle detection	Sensing when obstacles come across the user's path and giving directions to the user that makes them avoid the obstacle
Action prediction	Predict the user's actions based on observed habits and the user's schedule

4.3 Assumptions and dependencies

This product was developed using the assumption that the end users have no other implicating disabilities that would compromise the application's spoken directional capabilities. Dependencies used for this product are: Google Maps API and Google Voice Recognition Service, and the Mapwize API. The app depends on accessibility settings native to Android, such as TalkBack native to Android.

4.4 Cost and Pricing

This product has no cost associated with the development process. All dependencies used were free based on a developing account license. Advertising partnerships may be pursued to generate revenue if the app proves successful.

4.5 Licensing and Installation.

This product requires installation through a mobile OS application storefront. Installation and initial setup can be done by the end user's caretaker. All parties must agree to the terms and agreement provided by the app.

5. Product Features

5.1 Application Setup Process

Users should expect to be able to setup certain functionalities of the app such as user preferences and emergency contact information.

The following features pertain to interfaces oriented towards the visually impaired.

5.2. Using text to speech, display the user's current location

5.3 Select a destination

5.4 Make an emergency call

5.5 Using text to speech, display the next direction to take in the current route

5.6 Cancel current route

The following features pertain to functionalities that depend on system sensor values

5.7 Detect current obstacles in the user's path

5.8 Make an emergency call if the system detects a fall

The following features pertain to functionalities required by users such as caretakers of the visually impaired, etc.

5.9 Set emergency contact information

5.10 Display current map visually

5.11 Display current route visually

6. Constraints

6.1 Access to a location finder

Current interior location providing technologies are still in infancy.

The system should be expected to accurately measure the user's location to a degree which will suffice for navigational purposes.

6.2 Hardware capability to run the app

6.3 Security

Security for the BBVINAA includes data privacy

User location information should be secure

6.4 Usability

Easy to use interface oriented towards the visually impaired

Emergency functionalities such as emergency contact should be easily accessible and identifiable to visually impaired users.