Vision & Scope Document

Theia: Navigation App for Blind & Visually Impaired People

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Table of Contents

Revision History

Name	Date	Reason For Changes	Version
Trisha Teredesai	10/25/2025	Adding template	1.0 draft
Trisha Teredesai	11/14/2025	Finished Scope & Limitations	1.0
Akalya Sridharan	11/16/2025	Working on Business Requirements	1.1
Hannah Garcia	11/17/2025	Working on Business Context	1.2
Hannah Garcia	11/18/2025	Finished Business Context	1.3
Akalya Sridharan	11/22/2025	Finished Business Requirements & Clean up document	1.4

1. Business Requirements

1.1. Background

Most GPS applications available, such as Google Maps, Apple Maps, etc., are meant to function outside, which are inaccessible to completely blind or visually impaired individuals. To navigate indoor environments, like schools, offices, and other public buildings, can be intimidating/challenging for these individuals. Here caregivers are usually tasked with accompanying visually impaired or blind individuals to navigate or familiarize them with the routes in advance.

Theia is being developed to satisfy this need by working to ensure indoor navigation is provided using voice control and guidance coupled with other functionalities (emergency alerts). This project should be created due to the increasing need for accessibility technology.

1.2. Business Opportunity

Blind and visually impaired individuals can experience difficulties while moving around indoor spaces like a college campus or office buildings. This is because they often have to depend on caregivers, service animals, and familiarity to help with mobility. Theia offers an opportunity to introduce indoor navigation capabilities that are fully accessible via the audio interface, personalized options and support for configuration by caregivers. Functions including caregiver route configuration, reminder notifications, and personalization for accessibility features help provide the app with distinct functionalities that align with the market demand in assistive technology.

1.3. Business Objectives

The main business objectives for Theia are:

- Increase mobility for the blind and visually impaired by providing them with reliable verbal directions
- Enhance personal security by enabling immediate notifications (<15 seconds) for emergency situations to designated caregivers or emergency personnel.
- Decrease caregiver-assisted navigation time by at least 40% by allowing users to follow voice indoor directions independently.
- Increase user autonomy by testing usability to ensure that at least 75% of visually impaired users complete their routes independently.
- Increase accessibility consistency to ensure successful performance of > 95% of voice commands via audio-only interaction.

1.4. Success Metrics

To determine the success of Theia, the following metrics and target values will be used:

No.	Metric	Target
1	Accuracy of verbal navigation guidance	Over 90% of test routes completed without intervention
2	User satisfaction rating	Majority positive rating from

		blind/visually impaired test users
3	Emergency alert delivery time	< 15 seconds after fall detection
4	Stability of offline core features	Navigation and alerts remain functional during loss of connectivity

1.5. Vision Statement

Theia will give blind and visually impaired individuals a safe and accessible indoor navigation system to assist them in navigating indoor spaces. Theia combines caregiver-assisted routing, verbal interaction, and emergency alert to ensure it creates a world where the blind or visually impaired can navigate an indoor environment freely.

1.6. Business Risks

Risk	**Severity**	**Mitigation Strategy**
Inaccurate indoor routing	Medium	Extend test cases to different buildings and modify routing preferences.
Low user adoption	Low	Provide simple onboarding instructions
Network issues affecting emergency alerts	Medium	Provide functionality to utilize alternative methods of emergency alerts and offline route capabilities
High caregiver configuration burden	Medium	Update UI to be more streamlined

1.7. Business Assumptions and Dependencies

Assumptions:

- The caregivers will be responsible for setting up routes, timings, and emergency contacts.
- Indoor spaces differ considerably; what matters here is flexibility rather than full automation.

Dependencies:

- Network connectivity for additional functionality (though basic functionality must be available offline)
- Hardware related to mobile devices (microphone/speaker)

2. Scope and Limitations

The project scope defines the concept and range of the proposed solution. It establishes expectations of features that will be in the product.

2.1. Major Features

1. Indoor Navigation: Accept a destination location from the user and navigate to it, providing the user with clear, verbal instructions.
2. Caregiver Mode: Allow the user's caregiver to set up the application with the needed routes and enter the users schedule.
3. Emergency Alerts: In case of emergency, send an alert to emergency contacts, namely the caregivers and first responders.
4. Reminders: Give reminders to the users according to their schedule, letting them know the best time to depart for their next destination.
5. Accessibility Settings: Various customization options to cater to the users' preferences and needs.

2.2. Scope of Initial Release

For the initial release, the app will be able to perform all the basic functionalities listed above. Firstly, since our target user base is blind and visually impaired, to fit their accessibility needs the app will use voice commands and also give verbal feedback. Next, since the main functionality of the application centers around indoor navigation, the caregivers will be able to configure routes and the visually impaired individual will be able to select their destination and the route will be displayed in the chronological order. The caregiver will also be able to configure the user's schedule. Lastly, the emergency alert will be configured to send an alert notification to the emergency contacts. The focus of the app is to provide a safe method of navigation for blind and visually impaired individuals and so the initial release aims to be aligned with our vision by helping our users navigate between rooms in a building, and also call for help if they run into trouble.

2.3. Scope of Subsequent Releases

In upcoming iterations of the application, we hope to build on the foundation established by the initial release, by expanding on the current features to better fit the needs of our target user base. Here are some of the projected changes:

1. Making navigation instructions time sensitive
2. Estimating ETA and providing reminder notifications to the user
3. Expanding on accessibility settings
4. Obstacle detection and avoidance
5. Route optimization, to find the alternative routes and suggest fastest route to user

2.4. Limitations and Exclusions

Due to the specificity of our application, our vision is to have it to be extremely customizable to fit the needs of all users. Every visually-impaired has varying support needs and a generalized application will isolate those with needs different from what the app caters to. Additionally, each user will use it in different environments like offices, schools, hospitals, etc. As such, a drawback of our implementation is that each component must be thoroughly configured by the caregiver. For this reason, we do not aim to

implement the use of an indoor map API or importing building floorplans into the application which would be able to determine routes without them being set up by the caregiver beforehand.

3. Business Context

3.1. Stakeholder Profiles

The table below describes the stakeholders actively involved with the project, who are affected by its outcome, or can influence its outcome. Each profile highlights the major value or benefits they will receive from the final product, their likely attitudes toward the product, their main interests in the project (such as specific application features), and the constraints that must be accommodated during the project life cycle.

Stakeholder	Major Value	Attitudes	Major Interests	Constraints
Developers	valuable resume item; helpful experience with new tools and working with an unfamiliar domain	see product as a learning opportunity for project management and development	demonstrable product that will positively impact and assist potential users	online format of course can limit development goals and team communication; time constraints of one semester; team size of 3 developers
Mentor	successful product story; opportunity to guide developers in their learning experience	supportive and flexible with implementation styles, with an open attitude to assist with the project process	developers' analysis and implementation of core features	online format of course can limit development goals and team communication
Blind and Visually Impaired People	ability to perform tasks or functions (navigation) with ease; improved usability and reduced frustration level compared to current applications	excited for a new product that has features that other applications do not have, with high hopes for product abilities and accommodations	gps navigation with obstacle detection; route optimization; reminder features; emergency alerts; audio features; highly customizable options across the entire app	must be accessible, easy to use, and safe to use
Caregivers or Guardians of Blind and Visually Impaired People	ability to perform tasks or functions (navigation) with ease; improved usability and reduced frustration level compared to current applications	excited and supportive about a new product and its overall system, especially with regard to unique features assigned to their role	caregiver options for entering in route navigation; caregiver options for configuring the user's schedule	must be easy to use and access caregiver options or emergency alerts
First Responders (Police Officers,	improved productivity; more opportunities to help others in work	interest in partnerships and involvement with the product after deployment	emergency alerts	usage complexity and level of involvement

Paramedics, etc.)				

3.2. Project Priorities

The table below describes the project priorities, listing dimensions, driving state objectives, any known constraints or state limits, and an assigned degree of freedom or state allowable range. The most important dimensions in our project are schedule and features. With Project Phase II's demo scheduled for December 1st and all documentation and deliverables due by December 7th, the team must meet all expectations to ensure a successful final product. High-priority, core features to be implemented during the development stage are guided by previously analyzed stakeholder scenarios. Taking stakeholders' needs and translating them into features assisted in determining their importance in the applications. Another important dimension is staff. Due to prior team issues, the developer team has decreased from five to three members, affecting the overall effort and the final product's possible quality. However, due to the course's emphasis on focusing on developing a few key features effectively, quality does not hold as much priority as other dimensions.

Dimension	Driver (state objective)	Constraint (state limits)	Degree of Freedom (state allowable range)
Schedule	release 1.0 to be available by 12/1		0
Features			70-80% of high priority features must be included in release 1.0
Quality			85-90% of user acceptance tests must pass for release 1.0
Staff		maximum team size is 1 PM, 1 mentor, and 3 developers	

3.3. Deployment Considerations

For the initial deployment of THEIA, the team aims to focus on implementing the foundational features detailed in Section 2. The operating environment must provide a highly responsive, safe, and efficient system that will fulfill user needs. This includes being accessible and online at all or most times. In the event of network failures, the app must still be able to perform core features, such as navigation or emergency alerts, to ensure user safety at all times. In terms of data storage, the product must be able to store, track, and eventually optimize user preferences and needs. Whether it be for customizable settings or frequent route calculations, the app must store and compute these metrics in order to guide the user effectively with minimal latency. Lastly, stakeholders involved with the app - especially third parties such as first responders - must be involved in the process of development. Since they will be involved with the app through the emergency alert feature, communication and collaboration are of high importance.