Vision and Scope Document

Moderamen

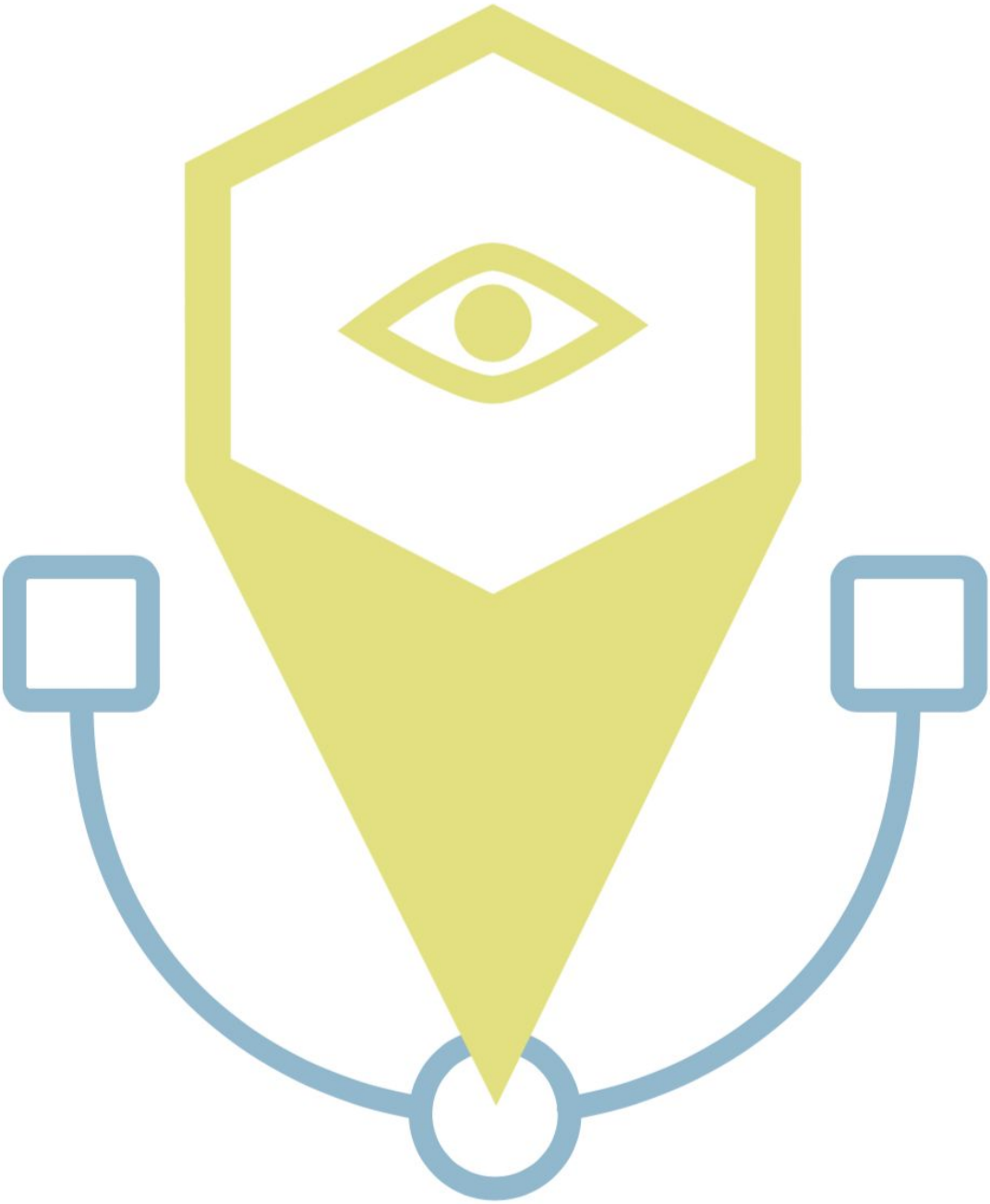

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Table of Contents

Table of Contents ii
Revision History ii
1. Business Requirements 1
1.1. Background 1
1.2. Business Opportunity 1
1.3. Success Metrics 2
1.4. Vision Statement 2
1.5. Business Risks 3
1.6. Business Assumptions and Dependencies 3
2. Scope and Limitations 3
2.1. Major Features 3
2.2. Scope of Initial Release 4
3. Business Context 4
3.1. Stakeholder Profiles 4
3.2. Project Priorities 5
3.3. Deployment Considerations 5

Revision History

Date	Reason For Changes	Version
11/22/2019	Initial release	1.0
12/2/2019	Final modifications and review	1.1

1. Business Requirements

1.1. Background

The market for disability assistance, especially for those who are visually impaired is sparse to say the least. Market research has shown that those with visual impairments often choose to stay at home, feeling as though "[the] world is not made for them"[1]. Those with visual impairments are often forced to navigate through treacherous environments without proper assistance – running into unforeseen obstacles and getting lost while navigating through buildings.
The Moderamen team seeks to reduce the problems that the visually impaired encounter while navigating the world through a user-friendly mobile application.

1.2. Business Opportunity

	Cane	*Guide Dog*	*Moderamen*	*Cane + Moderamen*	*Cane + Guide Dog*	*Guide Dog + Moderamen*	*Cane + Guide Dog + Moderamen*
See	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Feel	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Hear	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Talk	*No*	*Yes (Bark)*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Think	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Smell	*No*	*Yes*	*No*	*No*	*Yes*	*Yes*	*Yes*

Figure 1: Comparison of modern tools for the visually impaired (1)

The application seeks to assist the visually impaired with daily navigation, primarily indoors. The number of those with blindness (those with central visual acuity of 20/200 or less)[2] total about 7,675,600 (2.4% of the population) in the United States alone[3].

[1] Susan Crawford, "The Challenge of Helping Blind People Navigate Indoors," *WIRED*, n.d., https://www.wired.com/story/challenge-helping-blind-people-navigate-indoors/.

[2] Jeffrey H. Levenson and Alan Kozarsky, "Chapter 115 Visual Acuity," *Boston: Butterworths*, Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition., n.d., https://www.ncbi.nlm.nih.gov/books/NBK219/.

[3] "Blindness Statistics" (National Federation of the Blind, January 2019), https://www.nfb.org/resources/blindness-statistics.

Additionally, most of these people use sighted guides or guide dogs. In fact, “only an estimated 2 percent to 8 percent [use white canes]. The rest rely on their usable vision, a guide dog or a sighted guide.”[4] Making this app a useful tool for the visually impaired in place of a guide dog which can cost upwards of “$40,000 – $60,000”[5]; or a sighted guide which may not be available.

	Cane	*Guide Dog*	*Moderamen*
Ease of Usability	*High*	*Low*	*Very High*
Cost	*Low*	*Very High*	*Low*
Reliability	*High*	*Medium*	*Medium*
Functionality	*Low*	*Very High*	*High*

Figure 2: Comparison of modern tools for the visually impaired (2)

From *figure 1* and *figure 2* we can see that by functionality alone - guide dogs are the most useful to clients. However, taking into consideration the high cost for a trained guide dog[6], Moderamen would have a much larger client attainability with similar functionality. Similarly, a smartphone is much more convenient, that is – it can be carried on the person and stored nearly anywhere.

1.3. Success Metrics

Initial success metrics will be based heavily on accurate requirements gathering, the completion of these requirements and most importantly feedback from the user(s). During development, requirements gathering can be done through market research of interviews with users. Prototypes can be tested with stakeholders and feedback can be assessed and implemented in further versions. Success metrics will be loosely based on user feedback as well as assurance that the project passes all usability test performed, indicating that our application meets user requirements.
Additionally, we will attempt to maintain a budget of $0, so that we do not need to pay for any tools or equipment we use, and assure that the project follows the timeline outlined by the project’s specification document.

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[4] Bill Winter, “10 Fascinating Facts about the White Cane” (Perkins School for the Blind, n.d.), https://www.perkins.org/stories/10-fascinating-facts-about-the-white-cane.

[5] Colby Morita, “How Much Does A Guide Dog Cost?,” n.d., https://puppyintraining.com/how-much-does-a-guide-dog-cost/.

[6] Colby Morita.

Upon deployment, success metrics will be based on the respective marketplace review score, and furthermore based on each written review in the products marketplace profile.

Achieving success based on these metrics means assessing and improving the product based on user reviews. For initial deployment, we aim to see an average user score in the 60th percentile of the respective marketplace. Within 2 months we aim to increase this *to at least* the 75th percentile based on user reviews.

1.4. Vision Statement

"To provide blind with the means to navigate life."

1.5. Business Risks

Based on the requirements and features mentioned below, we wish to safely assist visually impaired persons through possibly risky and dynamic environments. Because of our user-base and functionality, it will be difficult to completely take away any risk that the app will harm the user due to faulty software and/or non-complete logic. The team will emphasize safety during development and complete regular, extensive testing. In addition, the product will notify the user of these risks to minimize legal troubles that may arise.

The next major risk the team needs to asses is that of competing applications. Based on research through popular marketplaces such as Google Play and Apple Store, there seems to be very little competition for indoor navigation especially for English speakers. The more popular navigation apps either involved connecting a non-visually-impaired volunteer to connect with the user and complete tasks[7] or relied on outdoor google maps[8] technology and did not have the functionality for indoor navigation[9]. As such, the risk of competition for this type of application is relatively negligible.

In order to minimize the risk of competition further, market research will be done extensively before and during the development process. After deployment, the team will add various features to make the product stand apart from any competition.

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[7] *Be My Eyes - Helping the Blind* (Be My Eyes, n.d.), https://play.google.com/store/apps/details?id=com.sails.buildngo&hl=en.

[8] *Maps - Navigate & Explore* (Google LLC, n.d.), https://play.google.com/store/apps/details?id=com.google.android.apps.maps&hl=en.

[9] Lew Lasher, *GetThere GPS Nav for Blind*, n.d., https://play.google.com/store/apps/details?id=com.LewLasher.getthere&hl=en.

1.6. Business Assumptions and Dependencies

The largest assumption we are making assumes that the users have the required software and hardware to run the application.

There is very little data correlating blindness with the use of a smartphone. Thus, we are assuming that enough visually impaired users have and use their smartphone in order to download our application from their respective app marketplace.
Making the above assumption, we must also assume that the users own a popular IOS or Android based device (at least initially, as the software will only be available for these devices). This is a relatively supported assumption as visually impaired individuals depend on software (text-readers, voice-recognition etc.) that is only widely available on more popular smartphones.

Next, we must assume that there are libraries available to complete the necessary functionality. This was supported with initial research done during requirements gathering. As such we can safely assume that there are IOS and Android independent software libraries for features such as text readers and directional assistance.
Finally, we must assume that the application can be successfully deployed to the Apple and Google Play marketplace.

2. Scope and Limitations

2.1. Major Features

According to market research[10], the two of the biggest challenges to independence for blind individuals are difficulties in accessing printed material[11] and the stressors associated with safe and efficient navigation[12]. Thus, as a development team we want to focus on independence from readable text (we will instead focus on a text-to-voice reader to convey information to the user).

The second challenge will be assessed through the main application software and are described below:

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[10] Nicholas A. Giudice and Gordon E. Legge, *Blind Navigation and the Role of Technology*, Engineering Handbook of Smart Technology for Aging, Disability, and Independence (pp. 479 500, n.d.).

[11] National Research Council, “Front Matter - Visual Impairments: Determining Eligibility for Social Security Benefits. Washington, DC” (The National Academies Press, 2002).

[12] Pierluigi Caddeo et al., “Wayfinding Tasks in Visually Impaired People: The Role of Tactile Maps,” *Springer-Verlag*, Cognitive Processing, 7, no. 1 (September 2006): pp 168–169, https://doi.org/10.1007/s10339-006-0128-9.

- Generate desired sentences and represent them with text as well as associating with a sound/voice.
- Be able to offer a visual interface for setup for caretakers/passerby.
- Allow Blueprints to be added to map database.
- Navigate the user through indoor spaces with the use of compass directional and specified number of steps (through smartphone pedometer).
- Ability to recalculate based on the user's movements.
- Accurately calculate routes and adjust based on the user's average step-length.
- Clearly notify the user of directions.
- To support additional languages that can be added.
- The app's voice should be clear and give easily understood commands/directions.
- The app's visual interface should be clear to users who have never seen the app before.
- Scalability so that more maps and more locations can be added/verified as time goes on.
- Notify the users of such changes to available blueprints (routes).
- Consistent application performance with consistent maintenance without service shut-down.
- The app will take the best measures possible to prevent leading users to possible harm.
- The app will not share personal identifying information. Any information shared is clearly communicated to the user.

2.2. Scope of Initial Release

All of the above requirements will be included in the initial release. Due to the nature of this project, only the prototype will be released.

3. Business Context

3.1. Stakeholder Profiles

Stakeholder	***Major Value***	***Attitudes***	***Major Interests***	***Constraints***
executives	*increased revenue, streamlined business processes*	*see product as source of income/market share*	*richer feature set than competitors, cost of development, time to market*	*maximum budget*
editors	*fewer errors in work and documentation*	*Assume the product has high usability*	*Error correction; ease of use; high reliability*	*Time constraints, must push out documentation regularly.*

Software developers	*Product development*	*compilation of requirements*	*Development of all features and requirements.*	*Time constraint, budget constraint. Hardware constraint (must work on personal computers). Software restraint (must work with non-provided IDE's, libraries etc.)*
QA Testers	*Minimize bugs, increase usability, reduced frustration level compared to current applications*	*Source of bugs*	*Amount and importance of bugs in the software*	*Time constraint, budget constraint. Hardware constraint (must work on personal computers). Software restraint (must work with non-provided IDE's, libraries, testing platform/modules etc.)*
Visually disables person(s)	*Provide market and financial viability for product*	*Tool for navigation*	*Features available, lack of bugs/issues, cost, reliability*	*Budget constraint*

3.2. Project Priorities

Dimension	***Driver (state objective)***	***Constraint (state limits)***	***Degree of Freedom (state allowable range)***
Schedule	*(prototype) release 1.0 to be available by 12/8*	*Primary development team size is 2 people. Development team is working under severe time constraints*	*None*
Features	*All requirements discussed above (see section 2.1) will be made available through the release 1.0*	*Primary development team is under time, software and hardware constraints*	*±1 of high priority features must be included in release 1.0*

Quality	*Software must include basic use-cases without failure*	*Primary development team is under time, software and hardware constraints* *QA testing is minimal*	*90-95% of user acceptance tests must pass for release 1.0, 95-98% for release 1.1*
Staff	*N/A*	*maximum team size is 1 Team lead, 3 developers, 3 QA testers, 2 documentation assistants*	*Team size cannot change, team members may be allocated to different jobs*
Cost	*No cost for application development*	*$0*	*None*

3.3. Deployment Considerations

The users for this application, as mentioned above in section 1.6 must have an Android or IOS based smartphone with access to a respective software marketplace (Apple store and/or Google Play).

The user may need network access to add public route blueprints, but the base app does not require network access.
For the initial deployment, the user will need to understand English.

Be My Eyes - Helping the Blind. Be My Eyes, n.d. https://play.google.com/store/apps/details?id=com.sails.buildngo&hl=en.

Bill Winter. “10 Fascinating Facts about the White Cane.” Perkins School for the Blind, n.d. https://www.perkins.org/stories/10-fascinating-facts-about-the-white-cane.

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Nicholas A. Giudice, and Gordon E. Legge. Blind Navigation and the Role of Technology. Engineering Handbook of Smart Technology for Aging, Disability, and Independenc. pp. 479 500, n.d.

Pierluigi Caddeo, Ferdinando Fornara, Anna Maria Nenci, and Amelia Piroddi. "Wayfinding Tasks in Visually Impaired People: The Role of Tactile Maps." Springer-Verlag, Cognitive Proccessing, 7, no. 1 (September 2006): pp 168–169. https://doi.org/10.1007/s10339-006-0128-9.