Course 6: Design Thinking SA

1. GITHUB LINK:https://github.com/pra123134/SA-C6
2. Streamlit Link: https://ugrwmfgcmrpfprywnau75t.streamlit.app/
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5. CRS Name: **Artificial Intelligence**
6. Course Name: **IDAI**
7. School Name: **Ryan Global School, Kharghar**

Project: Design a Smart System for Lost Individuals Support and Resource Mapping App prototype using a Design Thinking Approach.

Problem Statement:

Vulnerable groups, including children, the elderly, and individuals with cognitive impairments, often face significant challenges when navigating unfamiliar environments, leading to increased anxiety and the risk of becoming lost. Current navigation and emergency assistance systems lack real-time updates, intuitive interfaces, and effective communication channels with caregivers or rescuers. As a result, these individuals may struggle to find safe locations or access necessary resources in critical situations.

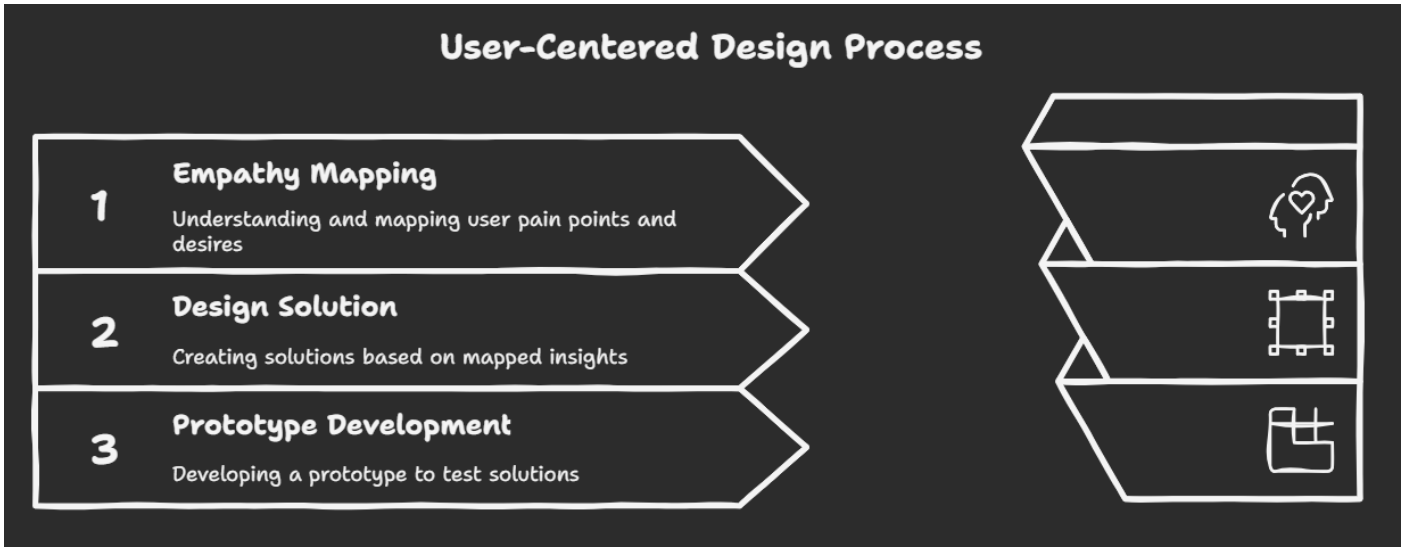
How might we design an intuitive mobile application that provides real-time navigation, connects lost individuals to nearby resources, and facilitates seamless communication with caregivers, ensuring their safety and well-being in unfamiliar surroundings?

Project Objective

The objective of this project is to design and develop an intuitive mobile application that enhances the safety and well-being of vulnerable groups, including children, the elderly, and individuals with cognitive impairments, by providing:

1. **Real-Time Navigation Assistance –** Implement a user-friendly interface with GPS-enabled navigation to guide individuals safely through unfamiliar environments
2. **Adaptive and Personalized Support –** Customize navigation and assistance features based on the user's cognitive abilities, age, and specific needs.
3. **Emergency Alert System –** Enable users to send distress signals and share real-time locations with caregivers or emergency responders.
4. **Seamless Caregiver Connectivity –** Establish instant communication channels between lost individuals and their designated caregivers for quick intervention.
5. **Access to Nearby Resources –** Integrate information on safe zones, medical facilities, and local assistance centers to provide timely support.
6. **AI-Driven Predictive Assistance –** Utilize AI to detect wandering patterns, predict potential risks, and proactively guide users to safer paths**.**
7. **Multimodal Interaction –** Offer voice, text, and visual-based navigation options to accommodate users with different cognitive and physical abilities.

By achieving these objectives, the application will empower vulnerable individuals to navigate confidently, reduce the risk of getting lost, and provide caregivers with real-time support tools to ensure their loved ones' safety.



Design Thinking Approach

Empathize: Researching Users' Needs

Step 1: Empathize and Define

User Research

1. *Interviews and Observations* :

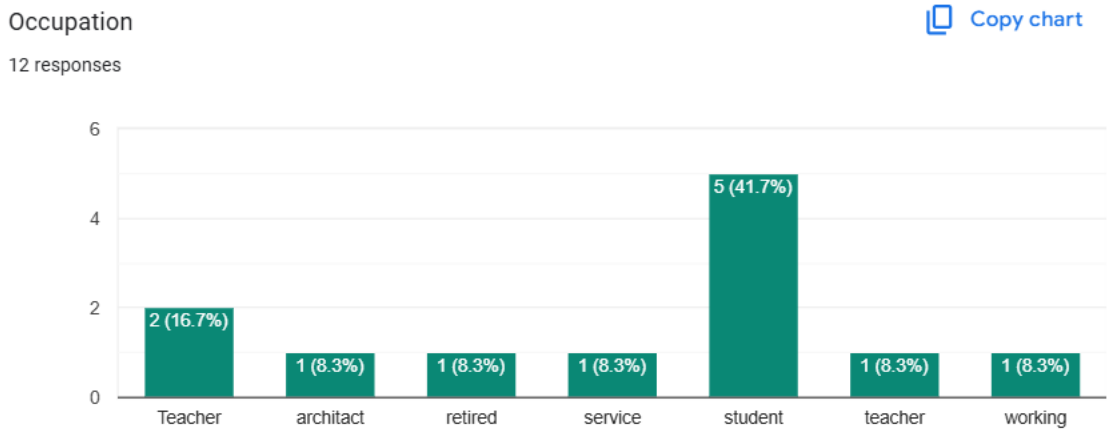
- Participants : 10 users from different demographics (children, elderly, individuals with cognitive impairments, and their caregivers) were asked following questions.

- Questions :

- What challenges do you face when navigating unfamiliar areas?
- How do you currently seek help if you feel lost?
- What features would you find most helpful in an app designed for navigation and emergency support?

-Google form was created and answers collected and analysed.
-Observations : Scenarios where users might get lost were discussed and brainstormed with studentsof A level CAIE.

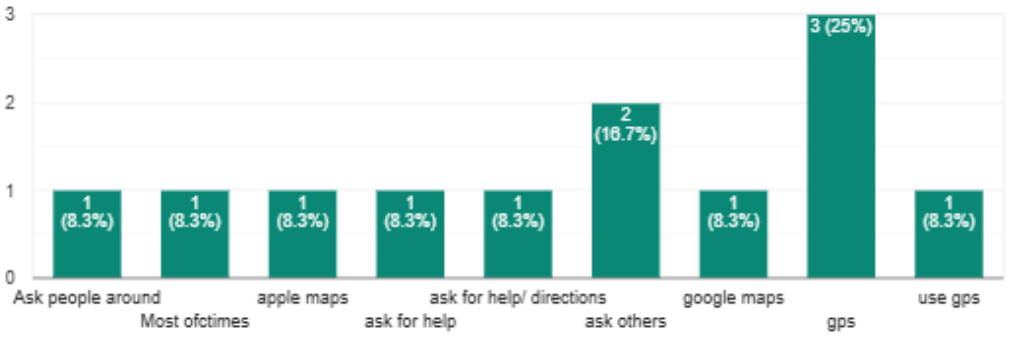
Form for data collecion: https://docs.google.com/forms/u/0/d/e/1FAIpQLSejcbIl8_N-BwZwKxBPHRH5r8iiI8KkeknfjvAoYM4CHLRZ3g/formResponse
Out of 12 response:



How do you currently seek help if you feel lost?

Copy chart

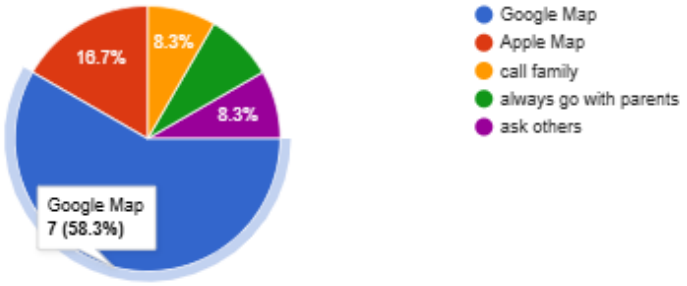
12 responses

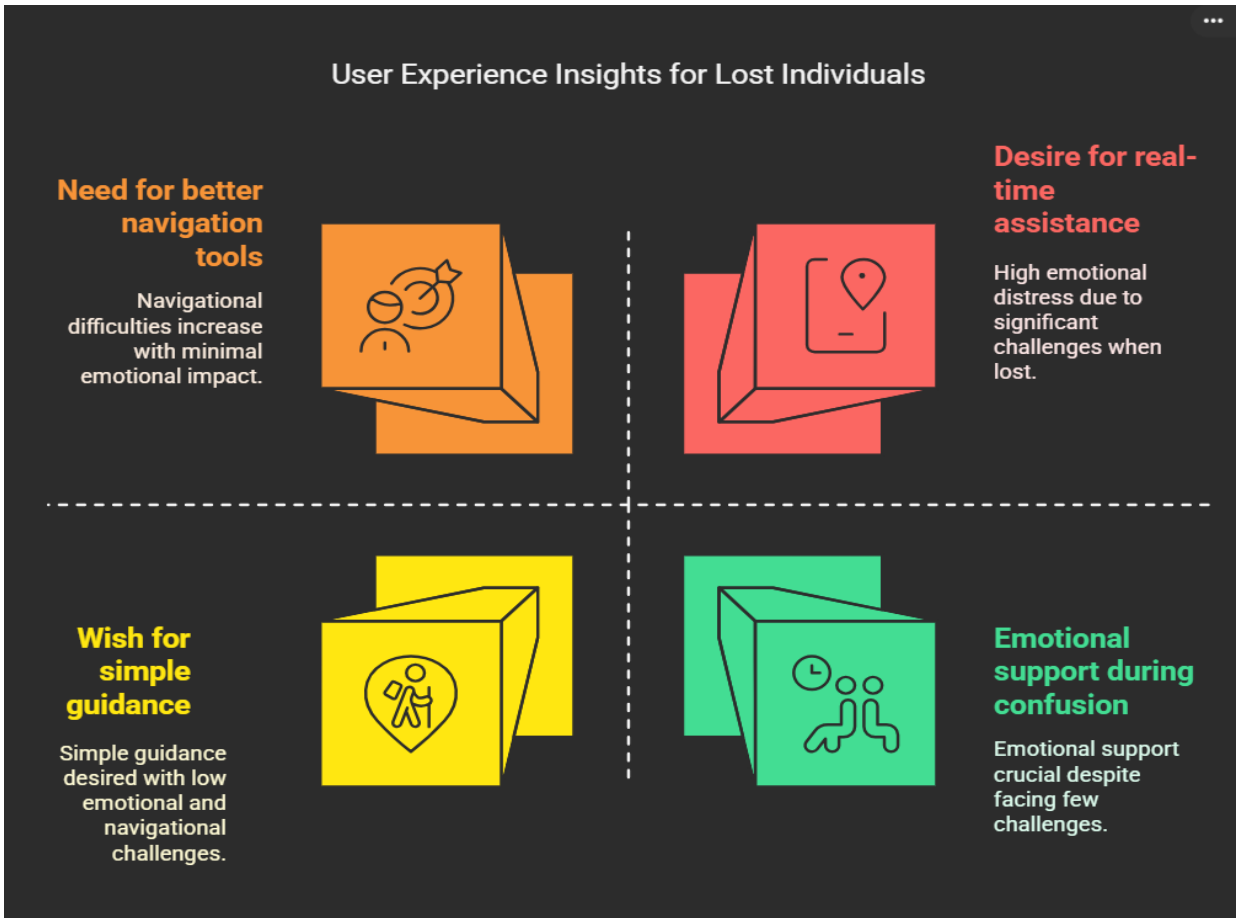


What features would you find most helpful in an app designed for navigation and emergency support?

Copy chart

12 responses



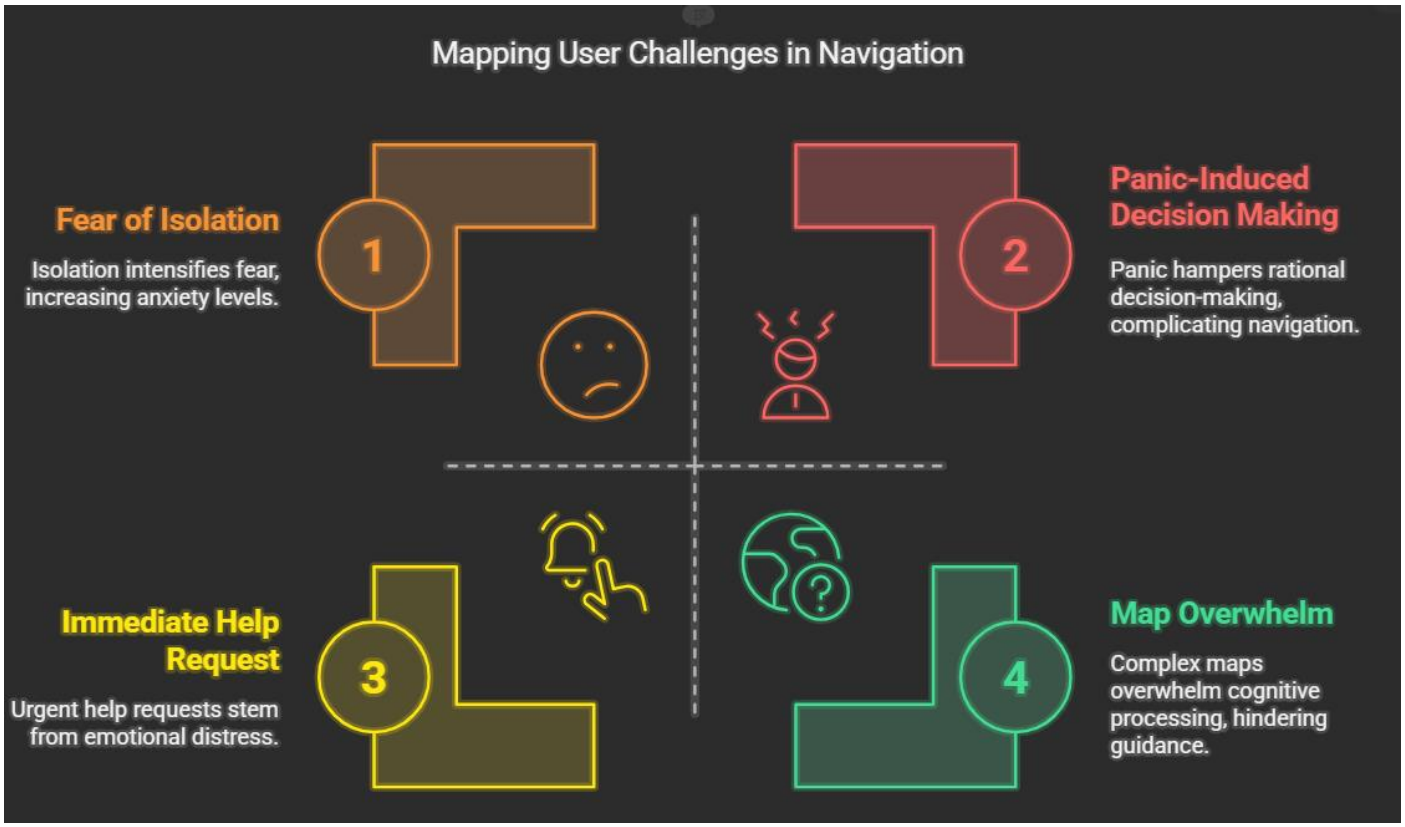


2. ***Insights :***
   - Elderly Users : Prefer simple interfaces with large buttons and clear instructions.
   - Children : Need gamified elements to engage them and keep them focused.
   - Cognitive Impairments : Visual cues and minimal text are required to avoid confusion.
   - Parents/Social workers/Caregivers: means to track their kids/ clients/person in need during emergency situations.

Empathy Mapping

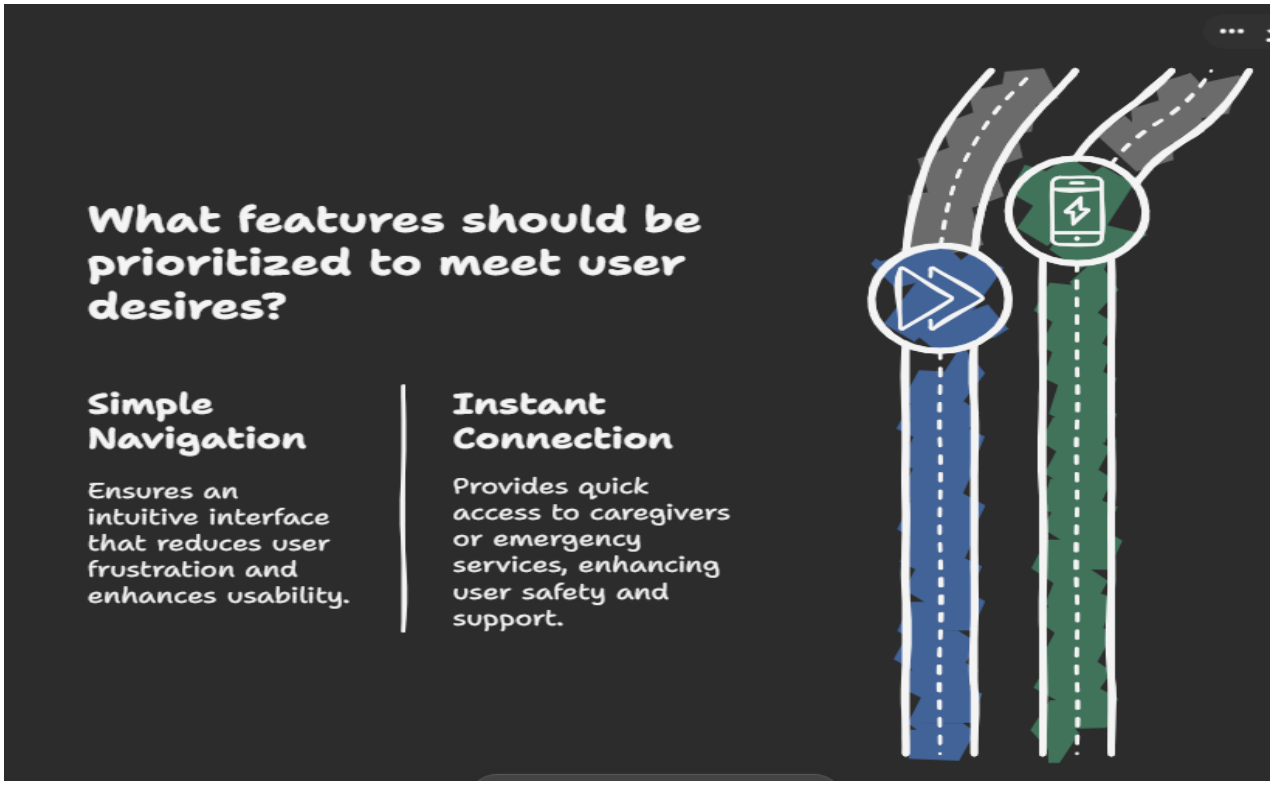
Pain Points

1. **Fear of Being Lost**: Individuals often experience anxiety and panic when they realize they are lost, which can hinder their ability to think clearly and seek help.
2. **Difficulty Understanding Complex Maps**: Traditional maps can be overwhelming and confusing, especially for those who may not be familiar with the area or who have cognitive challenges.
3. **Need for Immediate Assistance and Clear Guidance**: In moments of distress, users require quick access to help and straightforward directions to regain their bearings.



Desires

1. **Simple, Straightforward Navigation**: Users want an intuitive interface that provides clear, easy-to-follow directions without unnecessary complexity.
2. **Instant Connection to Caregivers or Emergency Services**: There is a strong desire for a feature that allows users to quickly reach out for help, whether from friends, family, or emergency services.



SWOT Analysis

Strengths	Weaknesses
● **Customized Support**: Tailored features for children, the elderly, and individuals with cognitive impairments to enhance reliability in critical situations. ● **Real-Time Resource Mapping**: Instantly identifies local resources and support networks for quick assistance. ● **User-Friendly Interface**: Simple design for easy adoption, especially by technology-averse users. ● **Social Worker Partnerships**: Collaborating with experts to refine services and improve credibility. ● **Proactive Alert System**: Notifies caregivers when an individual goes missing, ensuring faster response times.	● **Limited Awareness**: Low initial adoption due to lack of understanding; requires targeted marketing. ● **Tech Literacy Barriers**: Non-tech-savvy users may struggle; strong onboarding support is essential. ● **Resource Constraints**: Ongoing updates need funding; outdated information reduces reliability. ● **Privacy Concerns**: Handling sensitive data requires strong security to build user trust. ● **Integration Challenges**: Compatibility with existing support systems is key for seamless adoption.
👍Strengths	👎Weaknesses
● **Rising Safety Demand**: Increasing concerns for children and elderly safety create a growing market. ● **Awareness of Cognitive Impairments**: Educational efforts can position your system as a trusted solution. ● **Healthcare Partnerships**: Collaborations enhance credibility and expand audience reach. ● **Tech Advancements**: GPS and AI innovations improve functionality and market appeal.	● **Strong Competition**: Established solutions make differentiation essential through unique features or pricing. ● **Fast Tech Changes**: Continuous innovation is needed to prevent obsolescence. ● **Digital Safety Concerns**: Transparency and strong security measures build user trust. ● **Economic Challenges**: Flexible pricing can help attract budget-conscious consumers. ● **Regulatory Compliance**: Adapting to evolving data protection laws is crucial to avoid legal issues.

• **Government Support**: Alignment with senior care initiatives opens funding and growth opportunities.	
 Opportunities	 Threats

User Persona Development- Persona Examples:

Persona 1: Sumit**, the Elderly User**

- **Name**: Sumit Patel
- **Age**: 70
- **Occupation**: Retired Teacher
- **Location**: Suburban area
- **Technology Proficiency**: Basic (uses a smartphone for calls and messaging)

Background:
Sarah lives alone and enjoys going for walks in her neighborhood and nearby parks. She has a close-knit family who often checks in on her, but she sometimes feels anxious when venturing into unfamiliar areas.
Goals:

- To feel safe and confident when exploring new places.
- To easily find her way back home if she gets lost.
- To communicate her location to her family in case of emergencies.

Pain Points:

- Struggles with complex navigation apps that have cluttered interfaces.
- Finds it difficult to read small text and understand complicated maps.
- Worries about not being able to get help quickly if she feels lost.

Motivations:

- Values independence and wants to maintain an active lifestyle.
- Desires peace of mind for herself and her family regarding her safety.

Context of Use:

- Uses the app primarily when going for walks or visiting new places.
- Needs the app to be intuitive and easy to navigate, especially in stressful situations.

Quotes:
"I just want an app that tells me where to go without all the fuss. Clear directions and a big button for help would be perfect."

Sumit Patel

Age/Gender
70/Male

Location
Suburban area

Occupation
Retired Teacher

Family Status
Widowed, with grown-up

Bio

Sumit Patel is a 70-year-old retired teacher who lives alone in a suburban area. He is widowed and has grown-up children who live in different cities. Sumit enjoys reading books, gardening, and spending time with his grandchildren.

Motivations

Maintaining his independence, staying connected with family, and continuing to pursue his interests.

Devices

Basic smartphone and laptop

Goals

To stay independent and connected with his family and community, and to stay active and engaged in his hobbies.

Pains

Feeling isolated, difficulties in using new technologies, and concerns about his safety and well-being.

Brand Affiliations

Unknown

Persona 2: Ram, the Caregiver

- **Name**: Ram Krishnan
- **Age**: 35
- **Occupation**: Social Worker
- **Location**: Urban area
- **Technology Proficiency**: Advanced (frequently uses apps for work and personal use)

Background:
Jake works with elderly clients and individuals with cognitive impairments. He often accompanies them on outings and is responsible for their safety. He is always looking for tools that can help him monitor their well-being and provide immediate assistance if needed.

Goals:

- To ensure the safety of his clients while they are out in the community.
- To receive real-time updates on their location and status.
- To have a quick way to communicate with them in case of emergencies.

Pain Points:

- Current systems for tracking clients are often outdated and lack real-time capabilities.
- He feels anxious when clients are out of sight, especially in crowded areas.
- Needs a reliable way to alert emergency services if a client is in distress.

Motivations:

- Passionate about helping vulnerable populations and ensuring their safety.
- Seeks to improve the quality of care and support he provides to his clients.

Context of Use:

- Uses the app during outings with clients and while monitoring their activities.
- Needs the app to provide quick access to emergency resources and communication tools.

Quotes:
"I need to know where my clients are at all times. An app that keeps me updated would give me peace of mind."

Ram Kirshnan

Age/Gender
35/Male

Location
Unknown

Occupation
Social Worker

Family Status
Single

Bio

Ram is a dedicated social worker responsible for ensuring the safety and well-being of his clients. He is passionate about helping others and is always seeking tools to enhance his ability to monitor and support those in need.

Motivations

Helping others, making a positive impact in the lives of his clients, staying informed about the latest tools and technologies to improve his work.

Devices

Smartphone, laptop, wearable devices for monitoring health and safety.

Goals

To provide the best care and support for his clients, enhance their safety and well-being, and help them lead fulfilling lives.

Pains

Feeling overwhelmed by the responsibility of ensuring his clients' safety, dealing with challenging or emergency situations, lack of support or resources.

Brand Affiliations

Organizations or brands specializing in safety monitoring, healthcare technology, social support services.

Persona 3: Mia, the Child

- **Name**: Mia Johnson
- **Age**: 10
- **Occupation**: Student
- **Location**: Urban area
- **Technology Proficiency**: Intermediate (uses a tablet and smartphone for games and educational apps)

Background:
Mia is an adventurous child who loves exploring parks and playgrounds. However, she sometimes gets lost when playing with friends in unfamiliar areas. She enjoys using technology and is familiar with apps designed for kids.

Goals:

- To find her way back to her parents or a safe place if she gets lost.
- To have fun while using an app that helps her navigate.
- To feel empowered and confident when exploring new environments.

Pain Points:

- Gets overwhelmed by complicated maps and instructions.
- Needs an app that is engaging and easy to use.
- Worries about not being able to communicate with her parents if she feels lost.

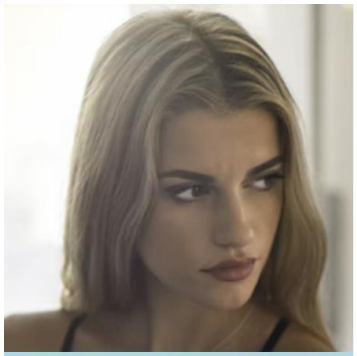
Motivations:

- Loves adventure and wants to explore new places safely.
- Desires independence while still feeling secure.

Context of Use:

- Uses the app while playing outside or exploring new areas with friends.
- Needs the app to be visually appealing and gamified to keep her engaged.

Quotes:
"I want an app that can help me find my way back home and is fun to use, like a game!"



Mia Johnson

Age/Gender **10/Female**

Location **Urban area**

Occupation **Student**

Family Status **Child**

Bio

Mia is a curious and energetic 10-year-old student living in an urban area. She enjoys learning new things and exploring her surroundings.

Motivations

Mia is motivated by her natural curiosity and desire to learn. She also seeks validation and approval from her parents and teachers.

Devices

Mia has access to a smartphone, tablet, and laptop for educational purposes and entertainment.

Goals

Mia's goal is to excel in school and make her parents proud. She also wants to make new friends and have fun experiences.

Pains

Mia's main pain points include feeling anxious or lost in unfamiliar situations, struggling with schoolwork at times, and occasionally feeling lonely or left out.

Brand Affiliations

Mia is familiar with popular children's brands and shows, but does not have any specific brand affiliations.

Persona 4:

- **Name**: Smita
- **Age**: 75
- **Behavior** : Struggles with traditional GPS navigation.
- **Pain Point** : Needs a simple interface with clear, step-by-step guidance.

Smita

Age/Gender **75/Female**

Location **Unknown**

Occupation **Retired**

Family Status **Elderly, living alone**

Bio

Smita is a 75-year-old retired individual who struggles with traditional GPS navigation systems. She needs a simple interface with clear, step-by-step guidance to help her find her way when lost.

Motivations

Maintain her independence and stay safe when out and about

Devices

Smartphone

Goals

To be able to navigate easily and independently when lost

Pains

Feeling lost and confused when navigating unfamiliar places, frustration with complicated GPS systems

Brand Affiliations

None

Persona 5:

Sarah Smith

Age/Gender
35/Female

Location
New York City

Occupation
Social Worker

Family Status
Married with two children

Bio

Sarah is a compassionate and dedicated social worker who is passionate about helping vulnerable individuals in her community. She is tech-savvy and always looking for innovative solutions to support those in need.

Motivations

Sarah is motivated by the desire to make a positive impact and improve the lives of those who are in vulnerable situations.

Devices

Smartphone, Laptop, Tablet

Goals

Sarah's goal is to provide better support and resources to lost individuals, especially children and the elderly, in her community.

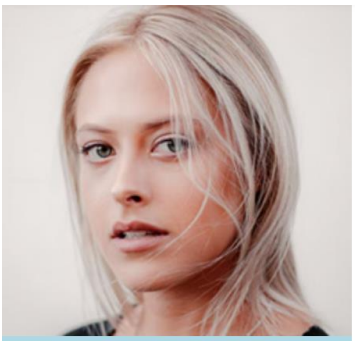
Pains

Sarah often feels frustrated by the lack of efficient and user-friendly systems to help track and support lost individuals. She also struggles with limited resources and funding for her projects.

Brand Affiliations

Apple, Google, Microsoft

Persona 6:



Raji Patel

Age/Gender
72/Female

Location
Mumbai, India

Occupation
Retired

Family Status
Widowed

Bio

Raji is an elderly Indian woman who lives alone and often struggles with technology. She fears using apps and tends to forget how to navigate through them. She is independent but worries about getting lost or needing assistance when out and about.

Motivations

Raji is motivated by the desire to maintain her independence and autonomy. She values her freedom and wants to feel secure knowing that she can access help when needed.

Devices

Raji owns a basic feature phone that she uses to make calls and send messages. She has a landline at home for communication. She does not own a smartphone or any other smart devices.

Goals

Raji's primary goal is to feel safe and supported when she is out alone. She wants to be able to reach out for help easily in case of emergencies or if she gets lost.

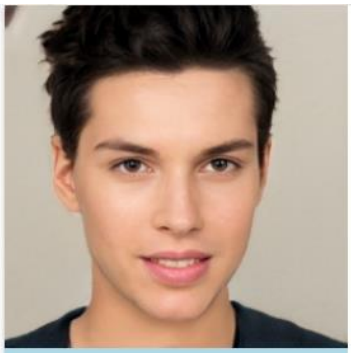
Pains

Raji's biggest pain point is her fear of not being able to use technology effectively. She struggles with apps and devices, which makes her anxious about using them in case of emergencies. She also worries about forgetting important information or getting lost due to

Brand Affiliations

Raji is not affiliated with any specific brands or technology companies. She is open to exploring new options that can help her feel more confident and secure when she is out alone.

Persona 7:



Michael

Age/Gender
25/Male

Location
Unknown

Occupation
Unemployed

Family Status
Single

Bio

Michael is a mentally challenged individual who has lost his way in an unfamiliar location and does not know how to navigate back home. He is feeling scared and confused.

Motivations

Michael is motivated by the desire to reunite with his family and feel safe again.

Devices

Michael does not have any devices with him as he is unable to operate or use them effectively.

Goals

His goal is to find a way back home safely.

Pains

He is feeling lost, scared, and helpless in a situation that he cannot comprehend.

Brand Affiliations

N/A

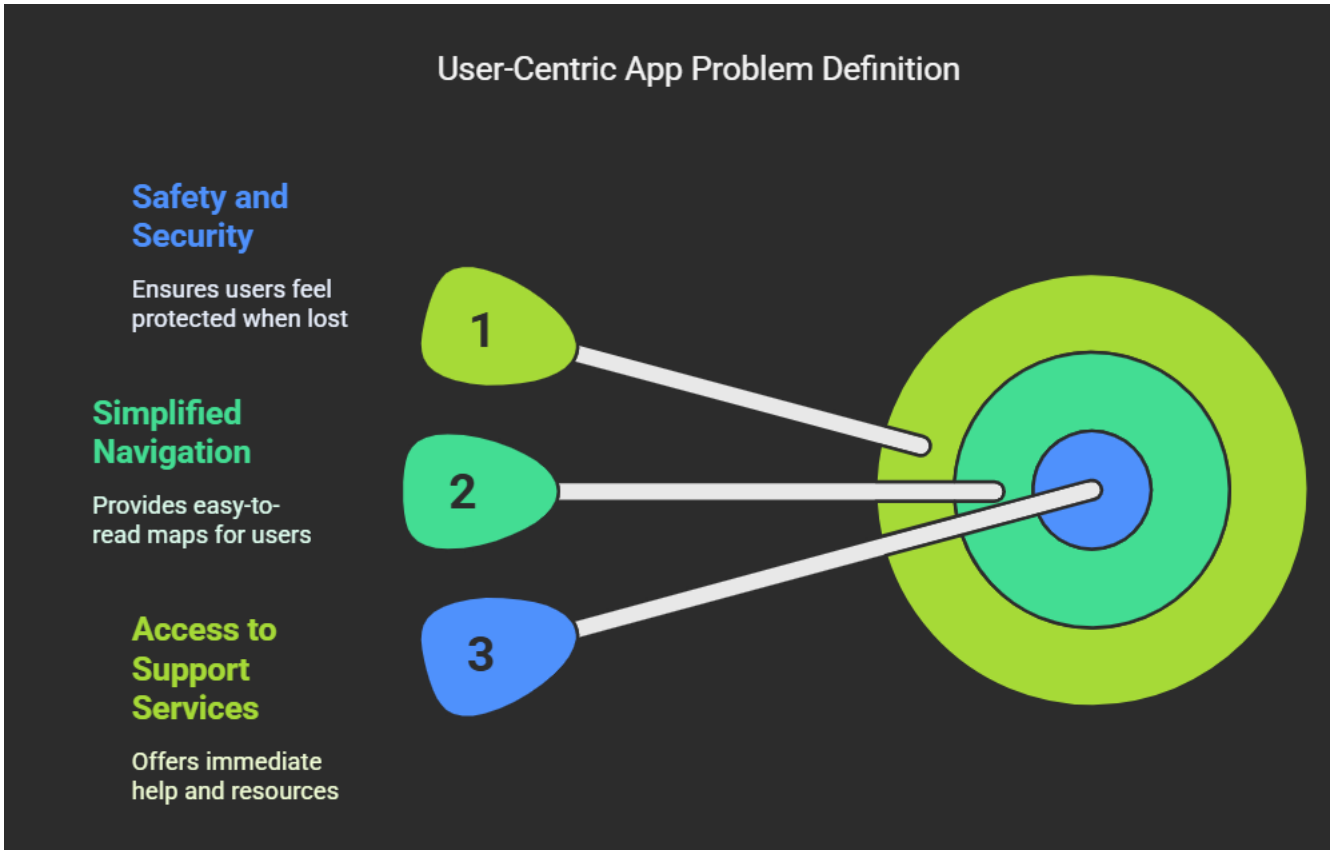
Define

Based on the empathy mapping insights, the core problems that the app aims to solve are:

- Users need a way to feel safe and secure when lost.
- Users require a user-friendly navigation system that simplifies map reading.
- Users need immediate access to support services.
- Needed a police station and was guided to the nearest one.
- Needed medical help and was directed to a nearby hospital.
- Got lost in a market and received AI chatbot guidance.

Problem Statement

- How might we design an intuitive app that helps lost individuals safely navigate unfamiliar areas, connects them to resources, and provides real-time updates to caregivers?



Step 2: Ideate- Brainstorm potential features and functionalities that could address the defined problems:

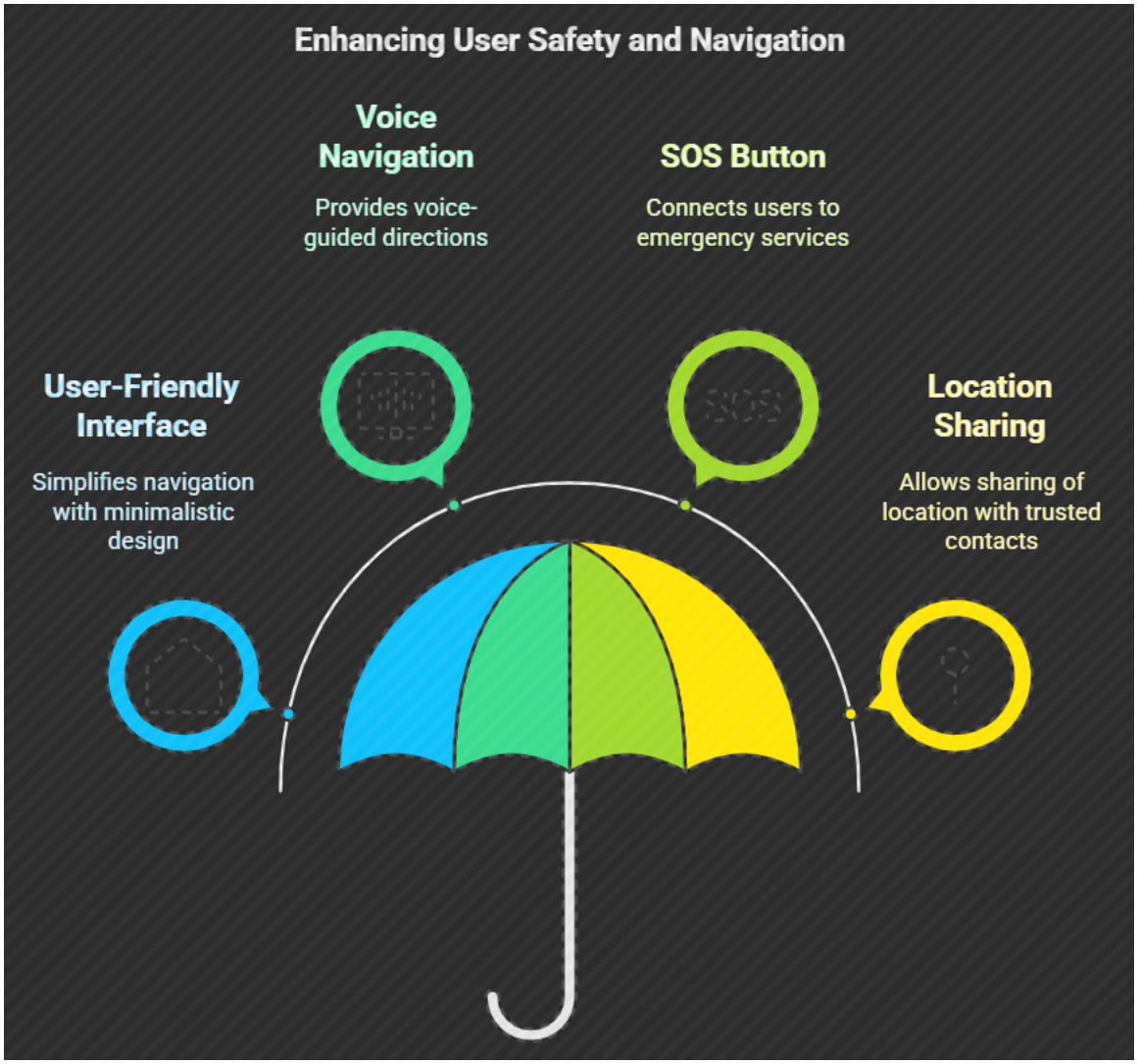
Brainstorming

Innovative Features :

- Visual SOS Flare : Sends location and emergency message.
- Emergency Resources Widget : Displays nearby resources.
- Multilingual and Accessible Interface : Supports various languages and audio guidance.

Unique Concepts

- Real-Time Mapping and Navigation : User-friendly maps with voice guidance.
- Caregiver Alerts : Periodic updates on the user's location.
- Vibration Feedback for Alerts : Ensures alerts are noticed in noisy environments.
- User-Friendly Interface: A minimalistic design that highlights essential navigation features.
- Voice Navigation: Implement voice-guided directions to reduce the need for users to read complex maps.
- SOS Button: A prominent button that connects users to emergency services or designated contacts with a single tap.
- Location Sharing: Allow users to share their location with trusted contacts for added security.



Step 3: Prototype- A low-fidelity prototype of the app that includes the following key screens:

Prototype Requirements and Features

1. **Home Screen**: Displays the user's current location and a simple navigation bar.
   Login/Sign-Up and Home Page:-
   - Simple login/sign-up with minimal input.
   The home page shows a map with emergency resources and a prominent SOS button.

2. **Real-Time Navigation** : Provides step-by-step voice-guided directions with visual cues :
   - Voice-enabled, step-by-step directions with visual prompts.

3. **Caregiver Alerts** :
   - Sends updates to family members about the user's location.

4. **Resource Mapping** :
   - Displays resources within a 500-meter radius with color-coded icons.

5. **SOS Alert System** :
   - Emergency flare that shares location and message with caregivers.

6. **Multilingual Support** :
   - Language preferences for diverse users.

7. **Vibration Feedback for Alerts** :
   - Vibration notifications for alerts.

Step 4: Test

User Testing

1. *Prototype Testing* :
   - Conduct usability tests with a group of users from the target demographics.
   - Gather feedback on the app's usability, clarity, and effectiveness in emergencies.

2. *Feedback Collection* :
   - Use surveys and interviews to collect qualitative data on user experience.
   - Identify areas for improvement based on user interactions.

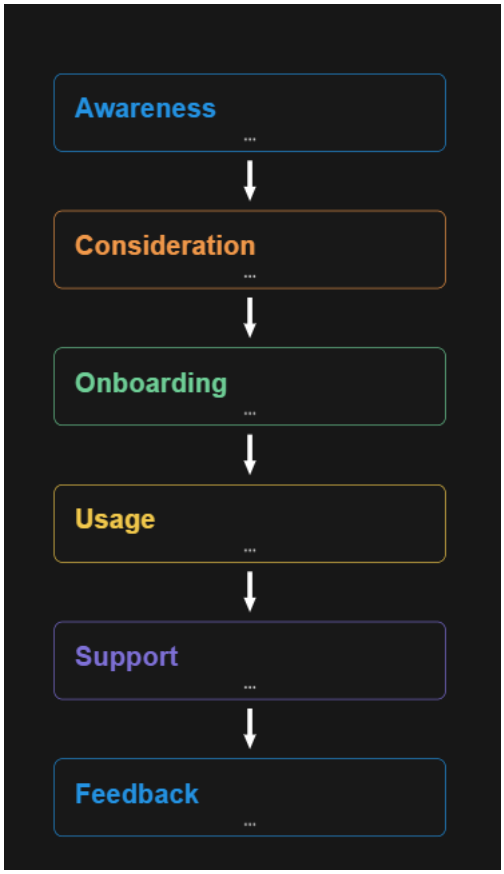
3. *Iterate* :
   - Refine the prototype based on user feedback.
   - Focus on enhancing features that users found confusing or difficult to use.

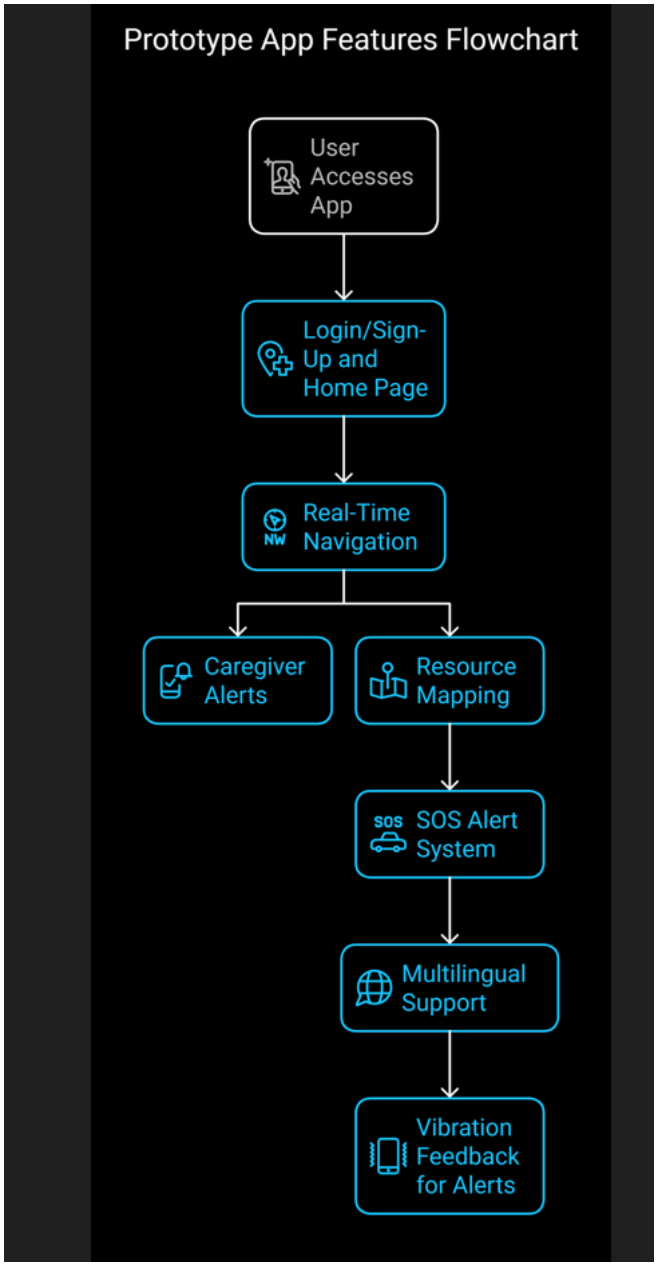
Technologies & Tools used

Napkin.ai
Uizard.ai
Motif.ai
Blackbox.ai
OnlinePersona creator- uxpressia.com/personas-online-tool, user persona.dev/
https://founderpal.ai/swot-analysis-generator
CHAT GPT

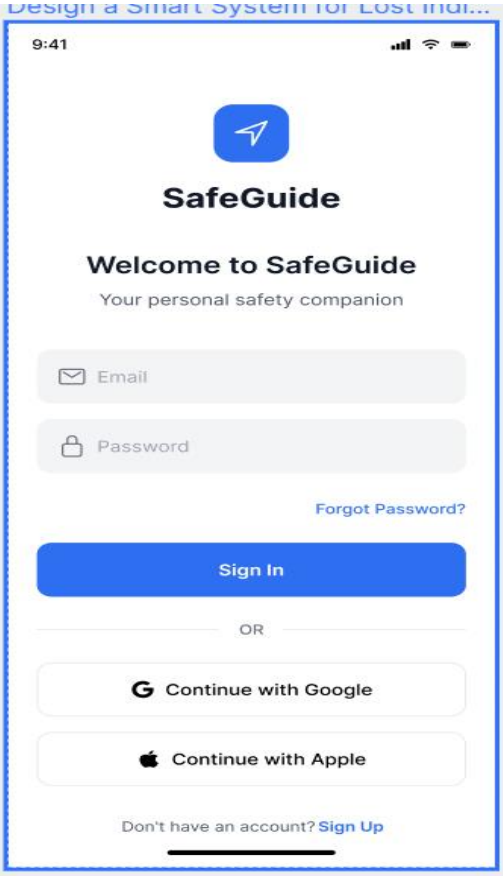
Demo & Screenshots

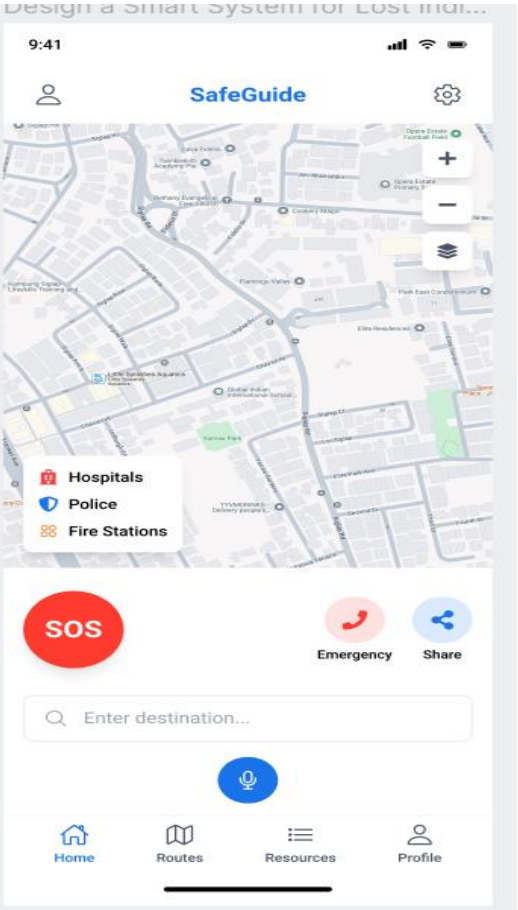
FlowChart

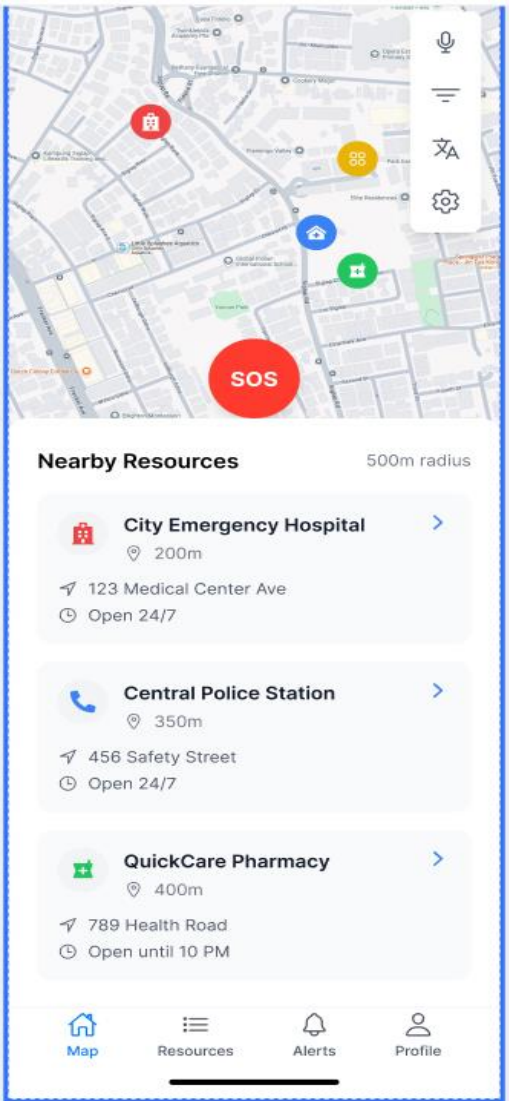


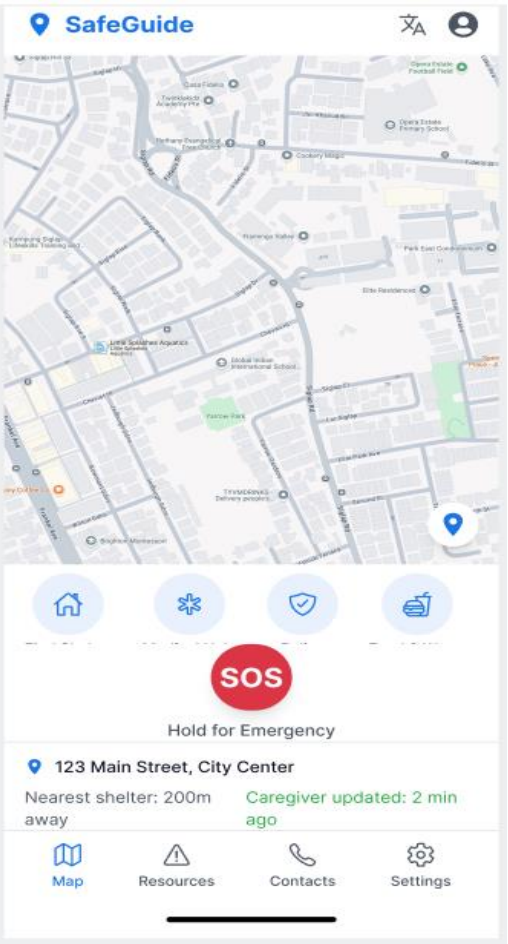


USER Interface


9:41
SafeGuide
Welcome to SafeGuide
Your personal safety companion
Email
Password
Forgot Password?
Sign In
OR
Continue with Google
Continue with Apple
Don't have an account? Sign Up


9:41
SafeGuide
Hospitals
Police
Fire Stations
SOS
Emergency
Share
Enter destination...
Home
Routes
Resources
Profile


SOS
Nearby Resources
500m radius
City Emergency Hospital
200m
123 Medical Center Ave
Open 24/7
Central Police Station
350m
456 Safety Street
Open 24/7
QuickCare Pharmacy
400m
789 Health Road
Open until 10 PM
Map
Resources
Alerts
Profile


SafeGuide
SOS
Hold for Emergency
123 Main Street, City Center
Nearest shelter: 200m away
Caregiver updated: 2 min ago
Map
Resources
Contacts
Settings

9:41

Sarah's Safety Status

Currently Safe
200m from Safe Shelter

Updated 2 min ago

View Full Map

Call Sarah | Message | Shar

Recent Alerts

Entered safe zone - Home
10:45 AM

Left designated area - Park
9:30 AM

Low battery warning - 15%
9:15 AM

Emergency Contact
John Smith - (555) 0123

Call Now

9:41

Caregiver Alerts

Sarah Wilson
Currently Safe

Updated now

200 meters from Safe Shelter

2 mins ago

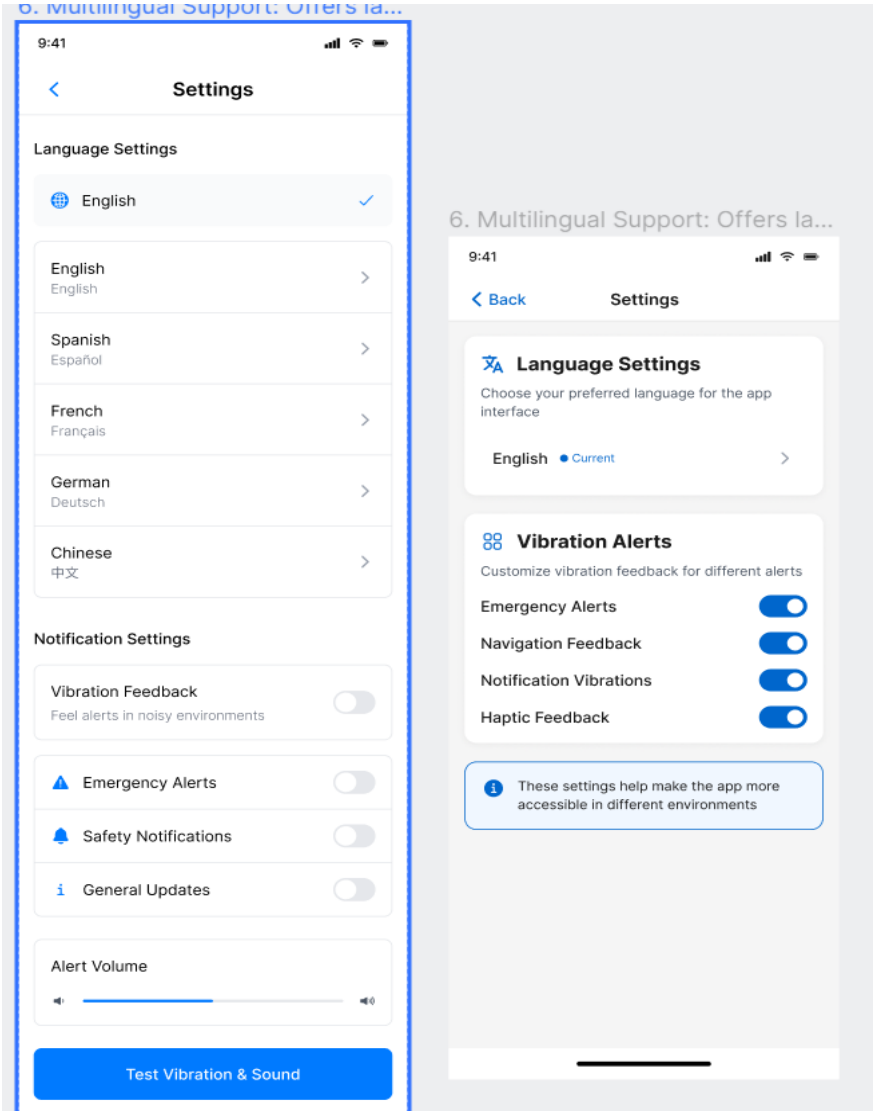
Recent Updates

Sarah arrived at the grocery store 10:45 AM
123 Market Street

Sarah left home 10:30 AM
456 Oak Avenue

Sarah is at home 10:15 AM
456 Oak Avenue

Emergency Contact



Prototype for app

https://ugrwmfgcmrpfprywnau75t.streamlit.app/

Conclusion

The **Smart System for Lost Individuals Support and Resource Mapping App** prototype serves as a crucial step toward enhancing the safety and well-being of vulnerable individuals in unfamiliar environments. By leveraging a **design thinking approach**, the app has been developed with a strong emphasis on user-centric solutions, ensuring **intuitive navigation, real-time assistance, and seamless communication** with caregivers and emergency responders.

Through an **iterative process of empathizing, defining, ideating, prototyping, and testing**, the system has been refined to address the specific challenges faced by children, the elderly, and individuals with cognitive impairments. Continuous feedback and improvements will further optimize its functionality, making it a **reliable and accessible resource** for those at risk of becoming lost.

Ultimately, this project contributes to fostering **greater independence, security, and confidence** among vulnerable groups, while providing caregivers with **efficient monitoring and support tools**. Moving forward, integrating **AI-driven predictive assistance, enhanced accessibility features,**

and broader community collaboration will ensure that the app remains a **scalable, impactful, and life-saving solution** in real-world scenarios.