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CSC1118

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1. Introduction

1.1 Overview

In the process of creation SafeHer stands out as a tool aimed at safeguarding women by offering them a blend of security measures and support services. By integrating elements that focus on protection with options for subtle use in times of threat SafeHer gives women the power to put their safety first. Through the web platform users find a gateway to safety alerts, emergency assistance and support for survivors. There's also talk of bringing this service to a mobile app soon.

Designed to be a beacon of hope for those in need of prompt safeguarding alongside strategies that lay the groundwork for future security, SafeHer stands out. The platform will also offer tools for enhancing personal safety, such as geolocation tracking, emergency contact notifications, and guidance on how to respond to potentially dangerous situations. Users will have the chance to tailor their safety settings and reactions to fit what they need personally.

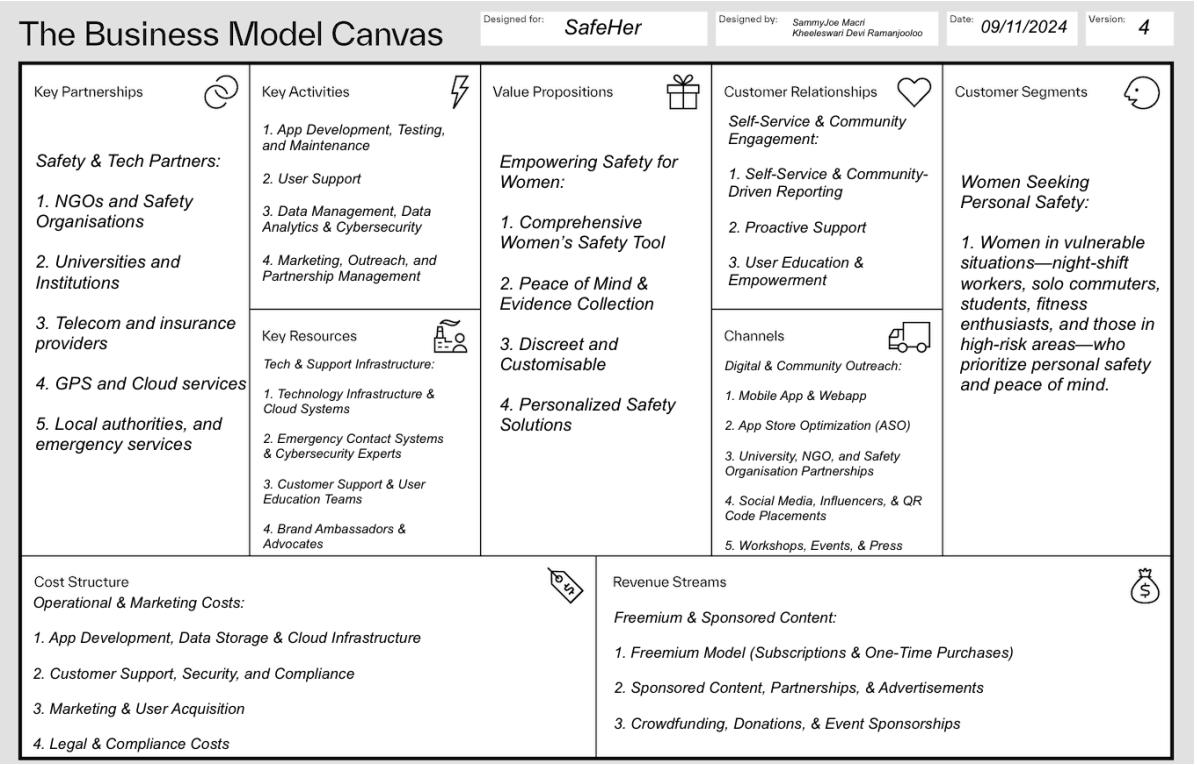
For users to take full advantage of SafeHer, they will be required to register with the platform, which will allow them to personalise their safety settings, monitor their alert history, and gain access to additional resources and services tailored to their unique circumstances. By registering one also gives SafeHer the ability to monitor how users interact with the site allowing it to offer specific functions aimed at making the platform work better for everyone.

SafeHer plans to add ways for its users to learn and connect by setting up spaces where they can talk about their stories, ask for guidance or offer some to fellow users. There's going to be a method in place for looking at and polishing the safety measures as per what users say and as things change making sure the platform stays up to date and in tune with what its users need.

The platform's development will focus on providing a seamless and discreet user experience, empowering women with the tools to feel safer and more in control of their personal security.

1.2 Business Context

Business Model Canvas (BMC)



1.2.1 Value Propositions

1. **Comprehensive Women's Safety Solution:**
   SafeHer serves as a comprehensive safety gadget; it includes live GPS location sharing an SOS feature that keeps a low profile customizable notifications for safety situations, maps that show dangers and a hidden mode making sure that in urgent times the safety measures taken stay out of sight.
2. **Peace of Mind & Evidence Collection:**
   With this app people can share where they are when things go wrong giving solid proof for later use. It gives folks the comfort of being able to record important times.
3. **Discreet and Customizable Safety Features:**
   SafeHer is designed for ultimate discretion, featuring a fake interface that enables users to activate safety functions without raising suspicion. The app's customizable settings allow users to personalize their safety experience based on their individual needs, from real-time tracking to hazard alerts specific to frequently visited areas.
4. **Real-Time Location Sharing & Emergency Assistance:**
   Users can share their real-time location with trusted individuals, ensuring that someone is always informed of their whereabouts in case of an emergency. With a single click, they can instantly notify contacts or emergency services, providing live location data and contextual information to help address the situation quickly and efficiently.
5. **Community Safety Reporting & Periodic Check-Ins:**

SafeHer cultivates a communal atmosphere by enabling users to report potential dangers or suspicious occurrences, thereby notifying nearby individuals. Furthermore, the platform's periodic check-in feature adopts a proactive stance in monitoring user well-being, helping to ensure their safety.

1.2.2 Target Users and Customers

Primary Audience:

- **Women of All Ages:** SafeHer is designed for women, particularly those in higher-risk environments like college students, solo travelers, professionals, or anyone navigating unfamiliar or unsafe areas.
- **Working Women & Caregivers:** Women commuting to and from work or managing family safety may also find SafeHer useful for peace of mind.

Secondary Audience:

- **Educational Institutions & Employers:** Universities and workplaces interested in promoting safety among students or employees can adopt SafeHer as part of their safety programs.
- **Nonprofits & Advocacy Groups:** Organizations focused on women's safety may partner with SafeHer to expand its reach and provide it as a resource for their communities.
- **Government & Emergency Services:** Partnerships with government entities and emergency services could enhance public safety systems and expand the app's user base.

1.2.3 Market Size

The global mobile safety app market is experiencing rapid growth, particularly in urban and suburban areas where safety concerns are more prevalent. Women aged 18-45 represent a significant portion of this market, and the app's broad appeal is further enhanced by the growing need for personal safety solutions across different demographics and regions. With the mobile app market valued at $407 billion in 2022, the safety app category holds a substantial share, positioning SafeHer for strong market potential. The app's multilingual capabilities and international outreach could further expand its user base, making it relevant across diverse cultures and geographies. Partnerships with universities, businesses, and government bodies will also increase the app's reach and credibility.

1.2.4 Revenue Streams

1. **Freemium Model:**
   The basic version of SafeHer will offer essential features such as location sharing, emergency alerts, and hazard reporting for free. Premium features, including extended tracking, advanced stealth modes, and enhanced privacy tools, will be available through a

subscription.

2. **Subscription Plans:**
   Monthly or annual subscription options will grant users access to premium features like more detailed tracking history, additional alerts, and integration with professional security services.
3. **Corporate Partnerships:**
   SafeHer will collaborate with universities, businesses, and government agencies to offer discounted or bulk pricing, allowing institutions to provide the app to their students or employees as part of their safety initiatives.
4. **Advertising:**
   Non-intrusive advertisements will be displayed within the free version of the app to generate revenue, ensuring that the core features remain accessible to all users while maintaining a free service model.

2. Function Requirements

2.1 General Description

SafeHer will initially be developed as a web-based application, focused on ensuring the safety of its users, particularly women, in distressing situations. The core functionality revolves around providing an accessible and intuitive interface that allows users to activate safety features with minimal effort. These features will include real-time location tracking, emergency alerts, stealth mode, and a hazard reporting system.

The primary objective of the app is to prioritize user safety by offering easy-to-use tools during high-pressure moments. The user interface will be streamlined and designed to be intuitive, enabling users to quickly activate safety measures without navigating complex menus. Once the web-based version is complete, it will be converted into a mobile application for both Android and iOS platforms, utilizing a cross-platform framework to ensure a seamless transition and consistent functionality across devices.

2.2 Initial Functional Requirements and Prototype Preparation

The initial prototype of the SafeHer app will focus on delivering the following core features, essential for ensuring women's safety in real-time situations:

1. **Register**
   A user must first complete the registration process in order to join the platform. The main page has a hyperlink that takes visitors to the registration form. Users must enter their password, username, age, address, and email address in order to finish the registration process. Since it serves as the basis for user interaction with the platform, this function is essential to the system. The project's main goal of having registered users would be lost without this feature. Furthermore, it facilitates the comprehension of user demographics and

profiles, allowing for enhancements and improved service provision. Technically speaking, HTML will be used to create the registration form in order to preserve the overall design of the website. The form inputs will be processed using Django functions, which will interact with a PostgreSQL database to store user data. The user information will be entered into a "users" table, with a foreign key linking to the user profile table.

2. **Log In**

   The login function allows users to access their accounts by entering their username and password. These credentials, which were established during registration, are validated by the system against the database. If the user forgets their username or password, they can recover it by using the "forgot username" or "forgot password" links. The login function is critical as it ensures only authorized users can access the system, maintaining the app's security. Security measures will be implemented to prevent unauthorized access. This function depends on the user having registered beforehand.

3. **Real-Time Location Sharing**

   This feature enables users to share their real-time location with trusted contacts, such as family, friends, or emergency responders, via email, SMS, and messaging apps. The location sharing feature is intended to be easily accessible with a single tap. The functionality of real-time location sharing is integral to the app's purpose of ensuring user safety, especially in emergencies. It will require integration with GPS and mapping APIs to enable accurate location tracking. For this feature to work, users must grant location-sharing permissions and have an active internet connection.

4. **Stealth Mode**

   Stealth mode provides a discreet, fake interface to hide the app's actual activity. This allows users to use the app covertly, ensuring privacy when necessary, while it continues to function in the background. The importance of stealth mode lies in its ability to protect users in dangerous situations by enabling them to use the app without drawing attention. Technically, designing a convincing fake interface and ensuring the app's background functionality is seamless are key challenges. This feature depends on the app's core functionality remaining operational in the background.

5. **Emergency Alert System**

   In the event of an emergency, individuals have the option to activate an alert by pressing a panic button. This action promptly transmits the user's location and relevant safety information to designated contacts and, when necessary, to emergency services. The significance of this feature cannot be overstated, as it allows users to quickly inform others during critical situations. The technical difficulties associated with this feature include

maintaining real-time location sharing, integrating with emergency services, and ensuring the swift delivery of alerts. The effectiveness of this feature relies on the proper functioning of the real-time location capability and the presence of trusted contacts in the user's profile.

6. **Periodic Check-Ins**
   The application will consistently request users to verify their safety status. Should the user not respond within a predetermined time limit, the application will activate an alert, informing their designated contacts and local law enforcement. These regular check-ins are essential for safeguarding users during situations where they might be in danger or unable to issue a manual alert. From a technical perspective, this necessitates the implementation of timed notifications, monitoring user replies, and escalating alerts to trusted contacts or authorities when necessary. This feature relies on users establishing trusted contacts and permitting notifications.

7. **Hazard Reporting**
   Users will be able to report hazardous locations or incidents they encounter, which will be shared with others in the vicinity to promote community safety. This feature is important for creating a safety network, where users help each other by reporting dangerous situations. A system will be required to manage the submission, storage, and sharing of hazard reports, with mapping functionality to pinpoint hazardous locations. This function relies on users' ability to submit reports and access their location.

2.3 Challenges to Overcome

- **Data Privacy & Security:** Protecting user location data is a primary concern. All location and personal data must be encrypted and shared only with trusted contacts and emergency services. Compliance with data protection regulations (e.g., GDPR) will be essential. Additionally, user authentication will require secure login processes, including two-factor authentication.
- **Location Accuracy & Reliability:** Maintaining accurate location data, even in areas with low GPS signal, will be a significant challenge. The app will need to integrate multiple data sources (GPS, Wi-Fi, cellular) and use fallback strategies to ensure reliable tracking in remote or obstructed environments.
- **App Performance & Battery Consumption:** The app must perform efficiently, even in emergency situations, without draining the user's battery or consuming excessive data. Optimizing background processes and minimizing resource-intensive operations will be crucial for performance.
- **User Interface (UI) Design:** Given the app's high-stakes purpose, the design needs to be simple yet powerful. The challenge lies in creating an intuitive interface that allows users to

quickly access and activate key safety features during stressful situations, without overwhelming them with too many options or distracting visuals.

2.4 Testing and Refinement

The prototype will undergo usability testing with target users to collect feedback on its design, functionality, and user experience. This feedback will be crucial in identifying pain points, technical issues, and usability improvements. The goal will be to refine the app's core safety features, ensuring they work seamlessly in real-life situations. The design will evolve iteratively, with enhancements to ensure a user-friendly experience and reliable functionality.

Long-Term Vision: Future Updates and Expansions

- **Enhanced Stealth Mode**: Further development of the stealth mode with improved fake interfaces and more advanced methods for discreetly signaling distress, including voice command functionality and AI-powered threat detection.
- **Self-Defense Resources**: A library of self-defense tutorials and safety tips tailored to different situations, enhancing the overall user experience by empowering users with knowledge.
- **Multi-Language and Global Expansion**: The app will support multiple languages and be localized for different countries, allowing a global user base to access the app's features, ensuring it's accessible and useful to women worldwide.
- **Wearable Device Integration**: Integration with wearable technology, such as smartwatches, to provide additional safety features, like discreetly triggering alerts or sending location updates.
- **Artificial Intelligence and Predictive Safety**: Use of AI to predict potentially unsafe situations based on user patterns, location data, and local crime statistics, offering proactive alerts to prevent incidents before they occur.
- **Community Features**: The app will evolve into a social platform where users can exchange tips, experiences, and safety advice, while also engaging in community-driven safety initiatives.

3. System Architecture

SafeHer will utilize a three-tier architecture consisting of the client, server, and database layers to ensure scalability, security, and maintainability. This structure will enable SafeHer to manage a growing user base, handle data effectively, and safeguard user information.

Client Layer:
The client will be a web-based app initially, accessible via a browser. It will offer features like user registration, login, and safety alerts. The frontend will be built using HTML, CSS, and JavaScript, with Bootstrap for responsiveness. Eventually, the app will transition into a mobile app using React Native or Flutter for Android and iOS compatibility.

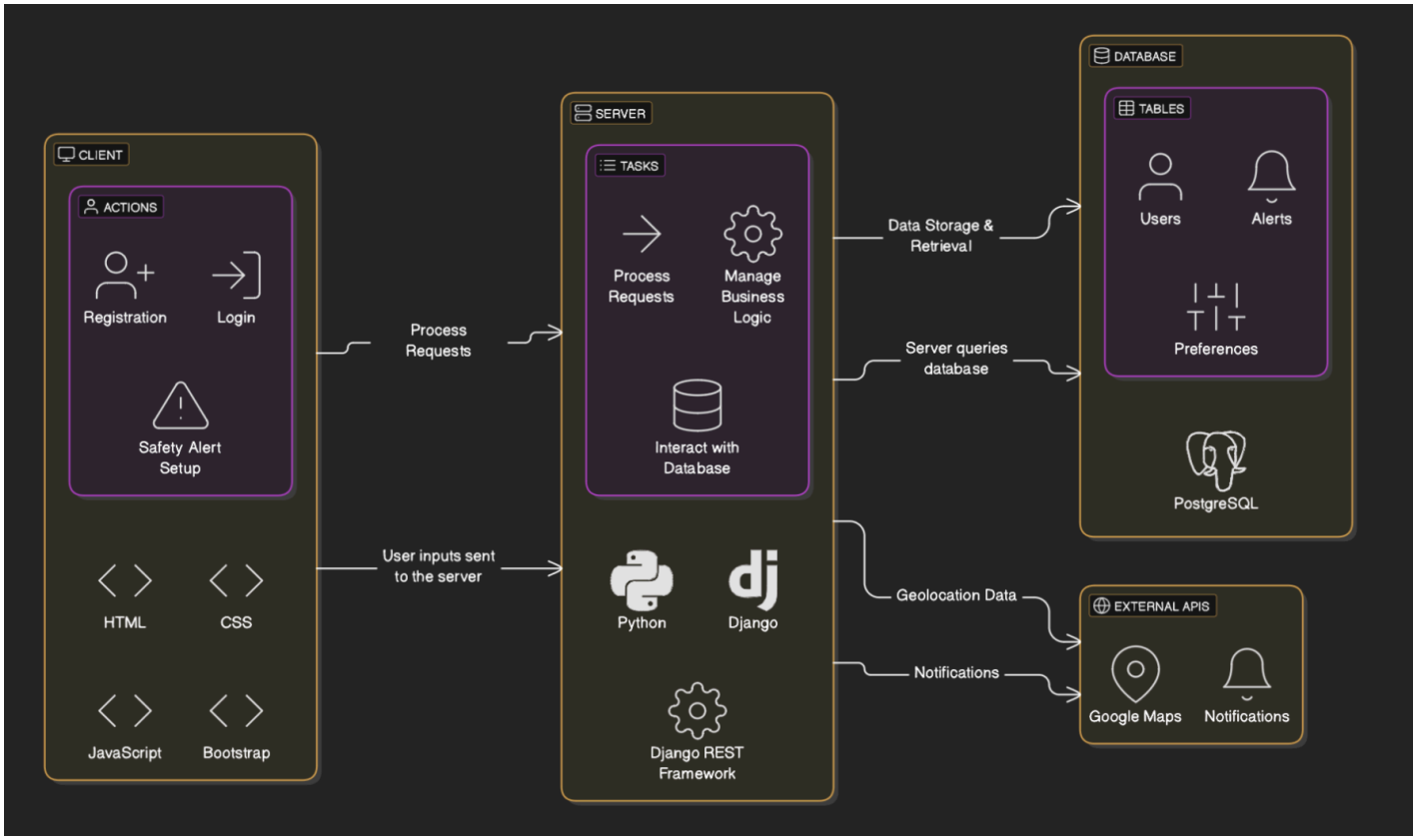
Server Layer:
The server will manage client requests, process data, and handle business logic. Python and Django will power the backend, including user authentication and request processing. The Django REST Framework will handle API integrations for features like geolocation and notifications.

Database Layer:
PostgreSQL will securely store user data, preferences, alerts, and hazard reports. Django's ORM will facilitate smooth database interactions, ensuring efficient data management and retrieval.

Data Flow:

- **User Registration/Login**: User data is sent from the client to the server for validation and processing.
- **Safety Alert Setup**: User preferences are saved in the database and used to trigger alerts during emergencies.
- **Geolocation and Notifications**: The app collects real-time location data, triggering notifications if the user is in danger or enters/exits a safe zone.

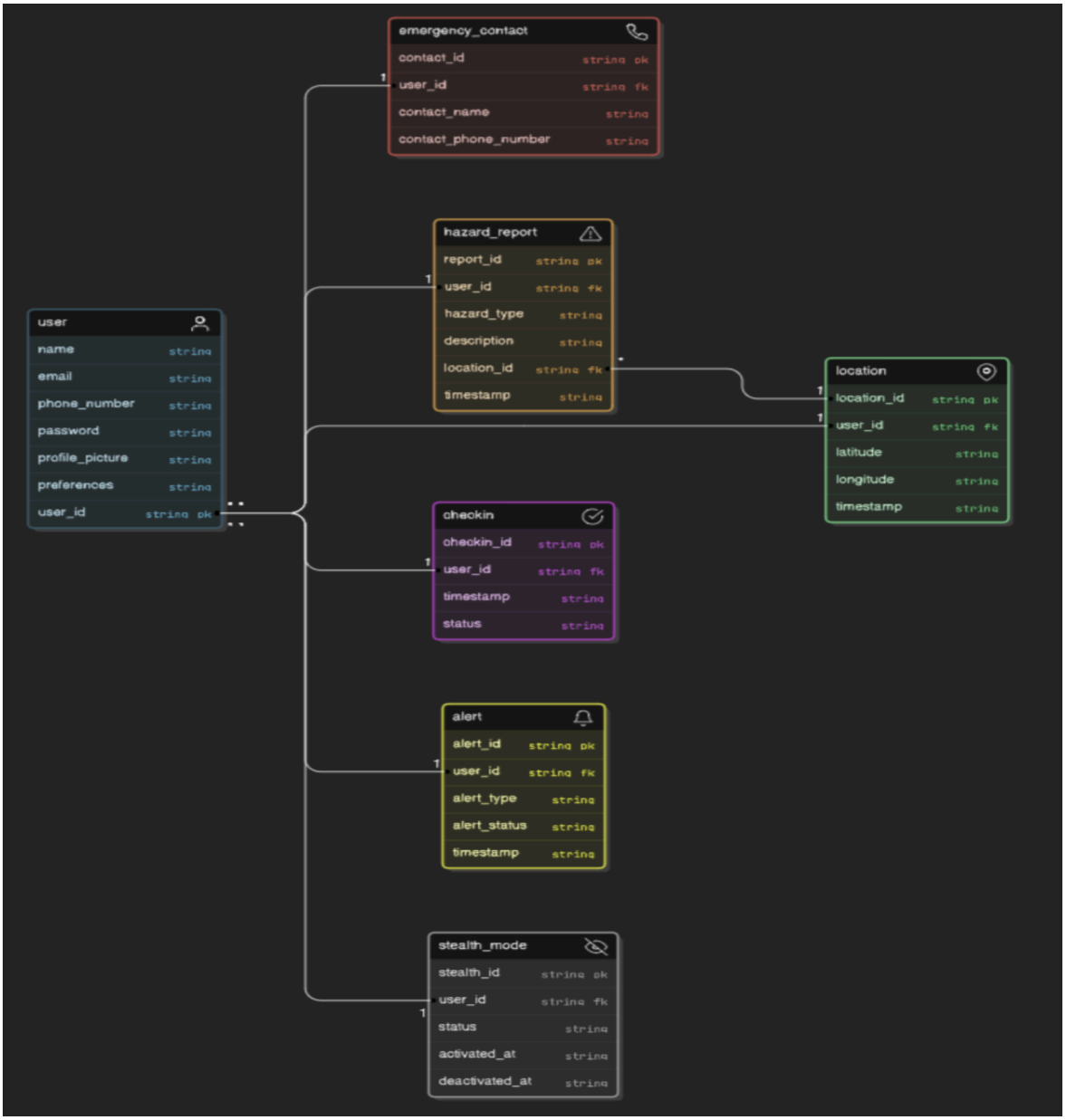
Advantages:
The three-tier architecture offers scalability to accommodate increasing users, security for sensitive data, and maintainability by allowing independent updates to each layer. It ensures a user-friendly client interface while offloading complex tasks to the server.



4. High Level Design

The **SafeHer** platform is structured around key entities that work together to provide comprehensive safety features. Each entity plays a specific role in managing user safety and ensuring timely responses in emergency situations.

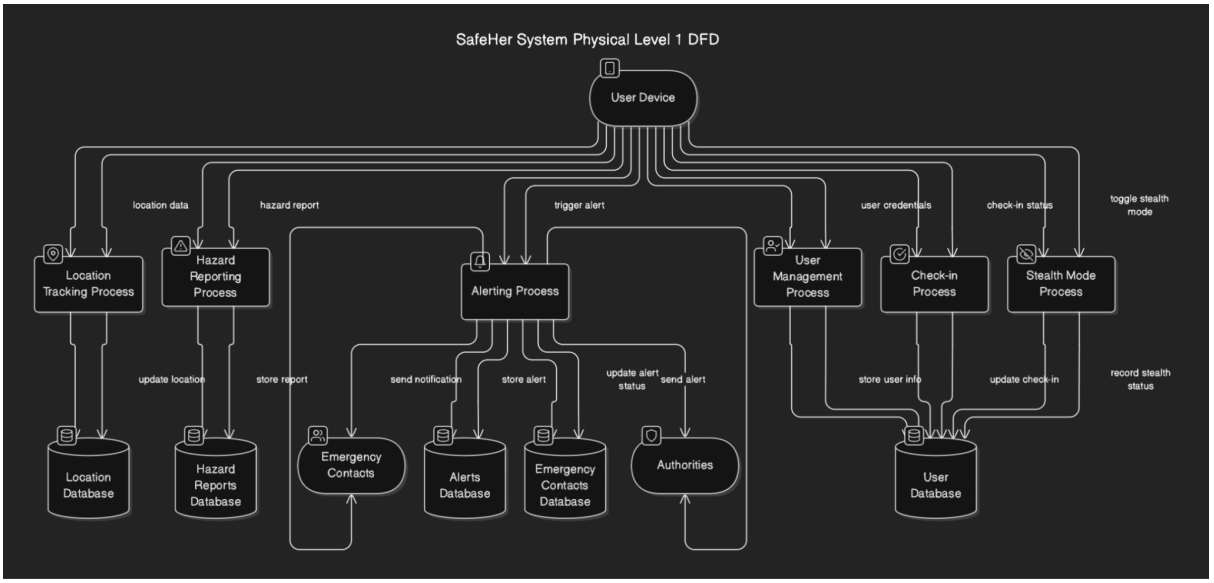
The User entity holds personal details and preferences, linking to other entities like Emergency Contacts, Hazard Reports, and Alert History. Users can store multiple emergency contacts, report hazards, and set up regular Check-ins for safety. In case of an emergency, the Alert entity notifies contacts and authorities with details like the type and status of the emergency. Stealth Mode allows discreet use in high-risk situations, while the Location entity tracks real-time geolocation for alerts when users enter or exit safe zones. Together, these entities create a comprehensive, personalized safety system.



The Physical Level 1 Data Flow Diagram (DFD) for SafeHer illustrates how data moves between physical entities, processes, and data stores. Key entities include the **User Device**, which sends alerts, check-ins, and hazard reports, and **Emergency Contacts** and **Authorities**, who receive notifications during emergencies.

- Processes include **User Management** (handling registration and profile updates), **Location Tracking** (collecting real-time location data), **Hazard Reporting** (storing hazard reports), **Check-in** (tracking user status), **Alerting** (triggering emergency alerts), and **Stealth Mode** (concealing activities when needed).
- Data stores are the **User Database** (storing user profiles), **Location Database** (tracking real-time location), **Emergency Contacts Database** (storing emergency contacts), **Hazard Reports Database** (storing hazard reports), and **Alerts Database** (logging triggered alerts and their statuses).

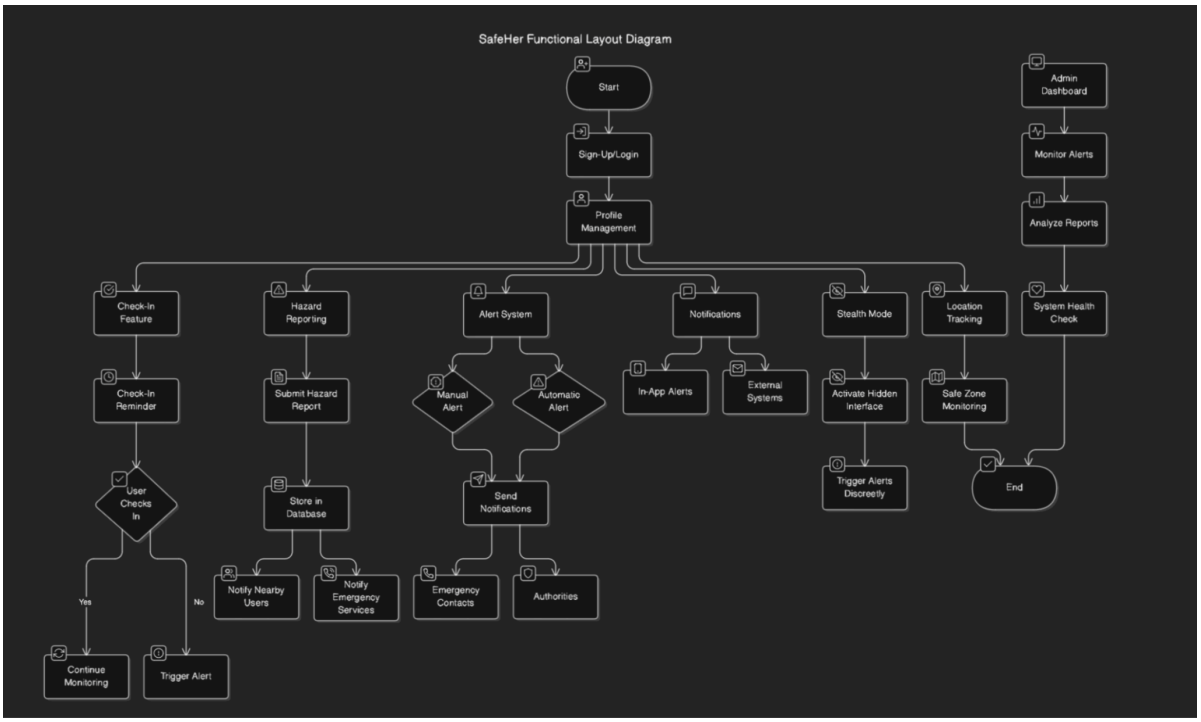
- The data flow involves the **User Device** sending data to processes, which then interact with the relevant databases. Notifications about alerts are sent to **Emergency Contacts** and **Authorities** via email, SMS, or app notifications.



SafeHer is a personal safety app aimed at ensuring women's security in various environments. It offers several key features for safety and emergency response:

- **Sign-Up/Login** allows users to create accounts or log in.
- **Profile Management** enables users to set up emergency contacts and customize safety preferences.
- The app continuously tracks the **location** of the user, with a **Check-In** feature for regular safety confirmations.
- In emergencies, users can trigger **Alerts** to notify emergency contacts, authorities, or SafeHer's monitoring team.
- **Stealth Mode** lets users discreetly send alerts without attracting attention.
- **Hazard Reporting** allows users to report dangerous situations, aiding awareness for others and authorities.
- **Notifications** keep users informed about check-ins, alerts, and hazard reports.

SafeHer provides users with tools to manage their safety and seek help quickly when needed.

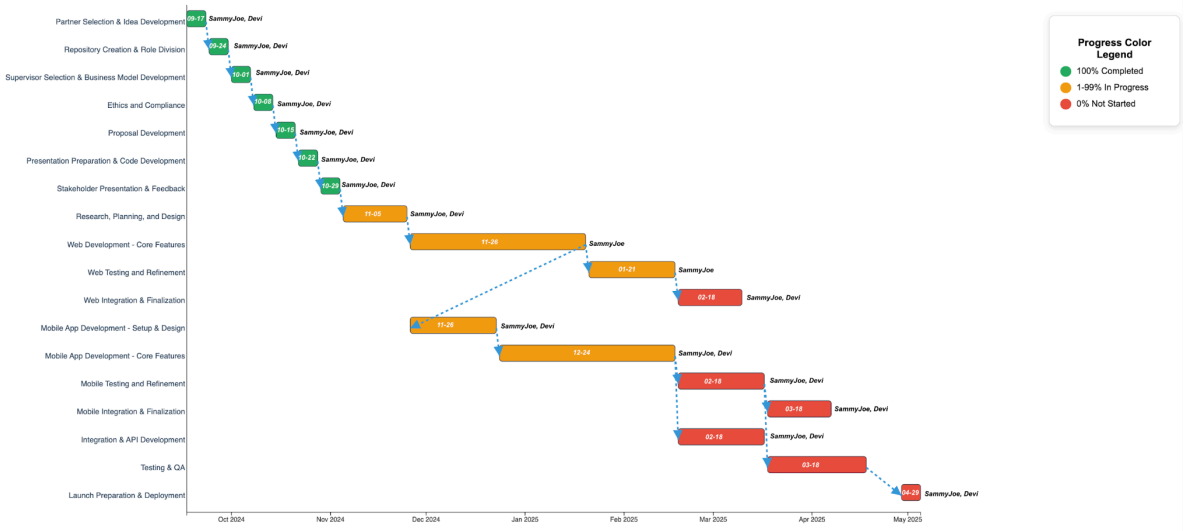


5. Preliminary Schedule

The proposed project timeline spans from September 2024 to May 2025, with deliverables organized into specific phases. The project will begin with partner selection, idea development, and business model creation in the first few weeks. Key milestones include proposal development, stakeholder presentations, and web and mobile app development. The core web and mobile app features, including user authentication, hazard reporting, and real-time tracking, will be developed and tested across both platforms. Integration of web and mobile platforms with backend systems will follow, with thorough testing and quality assurance before launch. The timeline is structured with clear tasks assigned to team members Sammy Joe and Devi, ensuring all deliverables are met within the proposed time frame. A detailed Gantt chart is included for visual representation of the project's timeline and tasks. The work has been split equally between the team members.

Task ID	Task Name	Duration	Start Date	End Date	Predecessor	Team Members	Description
1	Partner Selection & Idea Development	1 week	2024-09-17	2024-09-23	-	Sammy Joe, Devi	Establish collaboration and brainstorm project concepts using mind mapping and SWOT analysis.
2	Repository Creation & Role Division	1 week	2024-09-24	2024-09-30	1	Sammy Joe, Devi	Set up a GitLab repository and assign roles based on expertise.
3	Supervisor Selection & Business Model Development	1 week	2024-10-01	2024-10-07	2	Sammy Joe, Devi	Select a supervisor, refine the app idea, and draft the Business Model Canvas (BMC).
4	Ethics and Compliance	1 week	2024-10-08	2024-10-14	3	Sammy Joe, Devi	Create an ethics file addressing privacy, security, and compliance considerations.
5	Proposal Development	1 week	2024-10-15	2024-10-21	4	Sammy Joe, Devi	Draft the project proposal summarizing the app's concept, objectives, and timeline.
6	Presentation Preparation & Code Development	1 week	2024-10-22	2024-10-28	5	Sammy Joe, Devi	Develop a presentation for stakeholders and start coding the project in Django.
7	Stakeholder Presentation & Feedback	1 week	2024-10-29	2024-11-04	6	Sammy Joe, Devi	Present the proposal to stakeholders, incorporating their feedback into the project.
8	Research, Planning, and Design	3 weeks	2024-11-05	2024-11-25	7	Sammy Joe, Devi	Finalize project scope, gather requirements, and design UI/UX.
9	Web Development - Core Features	8 weeks	2024-11-26	2025-01-20	8	Sammy Joe	Develop essential web app features including user authentication, hazard reporting, and backend integration.
10	Web Testing and Refinement	4 weeks	2025-01-21	2025-02-17	9	Sammy Joe	Test core features, refine UI, and ensure functionality.
11	Web Integration & Finalization	3 weeks	2025-02-18	2025-03-10	10	Sammy Joe	Integrate web platform with backend and finalize features for deployment.
12	Mobile App Development - Setup & Design	4 weeks	2024-11-26	2024-12-23	9	Sammy Joe, Devi	Set up mobile app project, create UI/UX, and ensure compatibility with web features.
13	Mobile App Development - Core Features	8 weeks	2024-12-24	2025-02-17	12	Sammy Joe, Devi	Develop essential mobile app features including user authentication, hazard reporting, real-time tracking, stealth mode, and notifications. Integrate with backend.
14	Mobile Testing and Refinement	4 weeks	2025-02-18	2025-03-17	13	Sammy Joe, Devi	Test mobile app features, refine UI/UX, and ensure compatibility with web.
15	Mobile Integration & Finalization	3 weeks	2025-03-18	2025-04-07	14	Sammy Joe, Devi	Integrate mobile platform with backend and finalize features for deployment.
16	Integration & API Development	4 weeks	2025-02-18	2025-03-17	13	Sammy Joe, Devi	Integrate web and mobile platforms with backend and develop APIs for data exchange between platforms.
17	Testing & QA	6 weeks	2025-03-18	2025-04-18	16	Sammy Joe, Devi	Conduct testing for both web and mobile platforms, identifying and fixing bugs across both platforms.
18	Launch Preparation & Deployment	4 weeks	2025-04-29	2025-05-05	17	Sammy Joe, Devi	Finalize deployment setup, prepare for launch, and ensure smooth handover for app and web launch on respective platforms.

Project Gantt Chart



6. Appendix Resources

6.1 Research Findings

6.1. 1 Primary Research Insights

Through surveys, focus groups and interviews with women from various backgrounds, she found that there is a huge need for safety apps.

- **Urban Women:** Notably, these women tend to feel safer, but we still want to address the late-night commutes, mismanaged streets, and walking alone during odd hours. Nobody would complain if there were more features like being able to track right in the app in real-time, a secret SOS button, or speed alerts to improve personal security in those cases.
- **Rural Women:** Women living in rural or more underdeveloped areas rely on GPS tracking and emergency alert systems a lot more than others due to the longer emergency service response times. These women reiterated the need for a personal safety tool that you can really rely on when mobile network is weak or absent, so as to be able to call for help in isolated locations.
- **Trends with Users Age Group:** The study indicates that women between the ages of 18-45 are the majority user group for personal safety apps. Here, the focus is on data security, user privacy and minimal works in function to get the work done well, which is gaining in popularity.

6.1.2 Secondary Research Insights

International well being analysis says demand for private safety apps is up even greater than earlier than the pandemic, as many ladies began utilizing them as security devices. There is growing demand for safety applications in the market. At a Glance: World Health Organisation (WHO) research shows that 1 in 3 women across the globe are facing gender-based violence, demonstrating the dire need for a holistic solution like SafeHer.

Key points from secondary research:

- **Post-Pandemic Shift:** Women Remain Dependent on Personal Safety Apps After the Pandemic: Personal safety apps have continued to be depended upon by 52% of the women who utilize them after the pandemic. This points to an increasing recognition that there is an immediate need for safety and a rising trend in technology-based solutions to meet it.
- **Global Safety App Market:** Data suggests a rapid increase in the demand for personal safety applications. Women aged 18-45, who are particularly concerned about their personal security, are leading this demand.
- **Community Safety:** The rise of apps that allow users to report safety hazards and receive alerts about potential threats has also been identified as a key market trend, with SafeHer positioned to capitalise on this need.

6.2 Competitive Analysis

The market is currently dominated by several prominent personal safety applications, including:

- **Safe**: A widely-used app that provides SOS capabilities and location sharing. However, it falls short in features like stealth mode, making it less attractive for women who prioritize privacy and heightened security.
- **Life360**: While mainly centered around family safety, Life360 does not cater to the specific safety concerns of women, lacking features such as discreet emergency alerts and personalized check-ins..

6.3 SafeHer's Unique Selling Propositions (USPs):

- **Discreet Emergency Button:** In contrast to other solutions, SafeHer includes a hidden emergency button that can send alerts without attracting attention, ensuring a discreet option for women's safety.
- **Crowdsourced Hazard Mapping:** SafeHer leverages user-reported safety information, enabling women to highlight dangers in their surroundings and promote a community-oriented approach to safety.
- **Customizable Fake Interface:** A unique feature of SafeHer that enables women to activate a fake interface, providing an extra layer of security by disguising the app's true function in high-risk situations.

These distinctive attributes distinguish SafeHer from its rivals, guaranteeing it addresses the particular requirements of women in high-risk situations while providing more thorough security solutions.

6.4 Customer Interviews Summary

Interviews of women, undertaken from the 6th to the 8th interval of the project, uncovered significant aspects crucial to finalizing SafeHer's features:

- **Offering Assurance to Users:** Women elucidated how a hidden emergency button or the option to be tracked live would enable them to stay safe when they are in vulnerable environments.
- **Multifaceted Application**: Users were in favour of adding a community-based component where providers and users could report hazards and offer safety advice and assist each other in creating a safer experience.
- **Support for Underprivileged Sections of Society**: There is an evident opportunity for SafeHer to extend its scope beyond just women in urban settings to other underprivileged groups more at risk such as lone or elderly women and those in other socially deprived areas.
- **Ability to Tailor and Modify:** Women preferred that checks for safety are conducted at intervals of their choosing which allows them to use some features according to their schedules.

- **Trust and Reliability:** We all know that data security is the primary concern for the users. Across the board, users called for transparency alongside strong data protection, if the app is reaching for deep pockets of their personal data.
- **Encouraging Safe Behaviour:** Other users believed that SafeHer would be beneficial in promoting safe behaviour especially in mobilising community vigilance and using real-time data to work with the local authorities to improve safety.

7. Market Research

- **WHO Report (2021):** According to the World Health Organization, 1 in 3 women has experienced some form of physical or sexual violence, which directly correlates to the need for personal safety solutions like SafeHer.
- **Global Survey on Safety Apps:** Following the pandemic, 52% of women reported an increased reliance on safety apps, further emphasising the growing demand for apps that =s.

1. *Personal Safety Survey, 2024*. Available at: https://forms.gle/u7PQXNv7tzwpg3Ta8 [Accessed 5 Nov. 2024].
2. *SafeHer Interviews*, 2024 Available at: https://docs.google.com/document/d/1xpDg6Yepx53nn6j0hWaQ-h7Bcz1h6YvAvSdstP9lK1A/edit?usp=sharing [Accessed 5 Nov. 2024].