DOCUMENTATION

SOFTWARE ENGINEERING

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FEMSHEILD – Women Empowerment Application

FemShield — your digital guardian, empowering women with instant safety and smart protection anytime, anywhere.

1. Project Overview

- **Project Name:** Femsheild

- **Type:** Cross-platform Mobile & Web Application

- **Category:** Safety, Education, Health, and Empowerment

- **Tagline:** "Secure. Support. Strengthen."

- **Purpose:** To digitally empower women by combining security, self-growth, and social support tools in one platform.

- **Core Values:** Safety, Equality, Empowerment, Accessibility, and Trust.

2. Vision & Mission

Vision

To build a world where every woman feels safe, confident, and empowered to achieve her full potential.

Mission

To create a digital ecosystem that provides real-time safety support, learning opportunities, health access, and financial independence to women globally.

3. Project Scope

The scope of FemShield includes:

- Mobile application development for Android & iOS.
- Real-time **SOS emergency button**.
- **Live GPS tracking** and automated location sharing.
- **AI-based threat detection** using motion patterns and sound analysis.
- **Safe Zone Mapping** using crowd-sourced data.
- **Emergency contacts module** with instant notifications.

- **Community reporting system** for unsafe areas.
- **In-app chat** with verified support volunteers.
- **Cloud backend** for data management and analytics.
- Admin panel for monitoring and content management.

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4. REQUIREMENTS

Functional Requirements (FR)

- **User Registration:** Users can register via email, phone, or social login.
- **User Login:** Secure login using password, OTP, or biometric authentication.
- **Profile Management:** Users can update personal info and emergency contacts.
- **SOS Emergency Button:** One-tap SOS alert to notify contacts and authorities.
- **Live Location Sharing:** Real-time location sent to selected contacts.
- **Location History:** Past location data can be accessed for safety verification.
- **AI Threat Detection:** Detect unusual motion or sounds and trigger alerts automatically.
- **Safe Zone Mapping:** Map view of verified safe zones and unsafe areas.
- **Emergency Contact Management:** Add, remove, and manage trusted contacts.
- **In-App Chat:** Chat with trusted contacts or verified helpers.
- **Community Reporting:** Users can report unsafe locations or incidents.
- **Push Notifications:** Real-time notifications for alerts, safe zones, or reports.
- **Admin Dashboard:** Admin monitors alerts, reports, and user activity.
- **Report Verification:** Admin verifies and approves community-reported locations.
- **Map Integration:** Real-time map showing user location and nearby safe zones.
- **Incident History Log:** Records of past emergencies and actions taken.
- **Help Resources:** Quick access to safety tips and emergency procedures.
- **Device Compatibility:** Works on Android and iOS devices.
- **Multi-Language Support:** App supports multiple languages.
- **SOS Alert Confirmation:** Users can confirm or cancel accidental alerts.

Non-Functional Requirements (NFR)

- **Performance:** SOS alert must be sent within 2 seconds.
- **Reliability:** 24/7 uptime for critical features like SOS and tracking.
- **Security:** End-to-end encryption for chat and location data.
- **Scalability:** App can handle thousands of users simultaneously.
- **Usability:** Minimal steps required to trigger SOS or access key features.

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5. Actors of FemShield

Actor	Description / Role
End User	Women using the app for safety. Can trigger SOS, share location, view safe zones.
Emergency Contacts	Family, friends, or trusted contacts who receive alerts.
Admin	Monitors system, verifies reports, manages safe zones and alerts.
AI Threat Detection System	System component that monitors for threats (sounds, motion).
Community Users	Users reporting unsafe areas or suspicious activity.
Authorities / Law Enforcement	Optional external system or actor notified in case of serious emergency.

6. Work Breakdown Structure (WBS)

Level 1: FemShield Project

1. Planning & Analysis

- Requirement gathering
- Feasibility study
- Risk assessment
- Final SRS documentation

2. UI/UX Design

- Wireframes
- Prototype design
- User testing
- UI finalization

3. Frontend Development

- Splash screen & onboarding
- Login/Signup module
- SOS button module
- Location tracking UI
- Safe zone UI
- Emergency contacts screen
- In-app chat screen

4. Backend Development

- Database design
- API development
- User authentication system
- Live tracking system
- AI threat detection algorithms

5. Integration

- Frontend-backend API integration
- AI model integration
- Push notifications setup

6. Testing

- Functional testing
- Performance testing
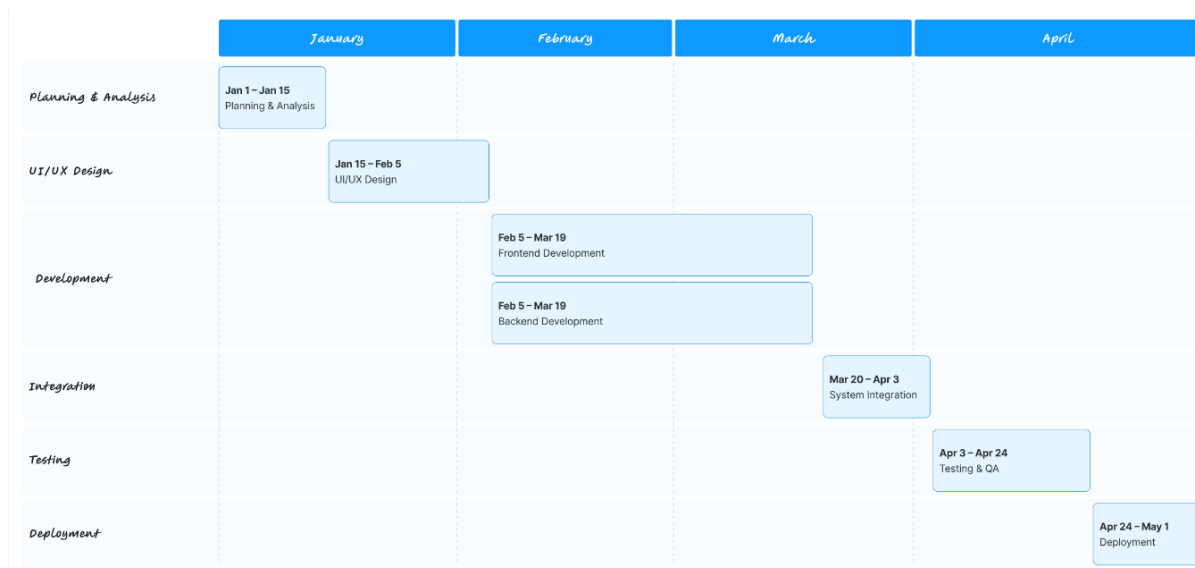- Security testing
- Beta testing

7. Deployment

- Deploy on Play Store
- Deploy on App Store
- Backend cloud deployment

8. Maintenance

- Bug fixes
- Feature enhancements
- Monitoring and analytics

7. GANTT CHART :

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8. RACI Matrix :

Task / Phase	Project Manager	UI/UX Designer	Frontend Dev	Backend Dev	QA Tester	AI Engineer
Requirements Gathering	**R**	C	C	C	I	I
UI/UX Design	A	**R**	C	I	I	I
Frontend Development	A	C	**R**	C	I	I
Backend Development	A	I	C	**R**	I	C
AI Threat Detection Module	A	I	I	C	I	**R**
Integration	**R**	C	C	C	I	C
Testing & QA	A	I	C	C	**R**	I
Deployment	**R**	I	C	C	C	I

- ☐ **R** = Responsible

- ☐ **A** = Accountable

- ☐ **C** = Consulted

- ☐ **I** = Informed

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9. Objectives

1. Strengthen women's safety and self-protection through technology.
2. Promote digital literacy and skill development for personal growth.
3. Encourage economic participation and career advancement.
4. Foster a supportive online community for mental, emotional, and social well-being.
5. Provide direct access to health, legal, and counseling professionals.

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10. Core Features

A. Safety & Security

- **Emergency SOS Button:** One-tap alert sends user's live location, picture, and message to emergency contacts and local authorities.
- **AI Threat Detection:** Uses motion and voice detection to automatically trigger SOS if distress is sensed.
- **Live Location Tracking:** Real-time monitoring for trusted contacts.
- **Safe Zone Alerts:** Warns users when entering high-risk areas.
- **Fake Call Simulation:** Generates an instant "incoming call" to help escape unsafe situations.
- **Incident Reporting Portal:** Allows users to anonymously report harassment or unsafe activities to authorities.

B. Health & Wellness

- **Mental Wellness Support:** Chat and audio counseling with psychologists.
- **Fitness & Diet Planner:** AI-generated routines based on body type and goals.
- **Medication Reminders:** Sends automatic alerts for medicines or supplements.
- **Awareness Articles:** Provides verified content on hygiene, reproductive health, and emotional wellness.

C. Education & Skill Development

- **E-Learning Center:** Free and premium online courses in technology, design, business, and self-improvement.
- **Language Learning:** Multi-language tutorials for better communication and employability.
- **Scholarship Finder:** Updates on national and international scholarships for women.
- **Skill Certification:** Provides certificates for completed online courses.
- **Mentorship Programs:** Connects users with experienced women professionals.

- **Career Bootcamps:** Offers short-term training for IT, marketing, and freelancing.

D. Employment & Financial Empowerment

- **Job Board:** Lists verified employers promoting women inclusion.
- **Freelance Projects:** Opportunities for remote work and entrepreneurship.
- **Resume Builder:** Professional CV and cover letter generator.
- **Startup Support:** Offers mentorship and funding access for women-led startups.
- **Financial Literacy Section:** Educates on budgeting, investments, and business planning.

E. Community & Support Network

- **Women Forums:** Discussion rooms for advice and shared experiences.
- **Legal Assistance:** Access to lawyers for domestic violence, harassment, or family issues.
- **Anonymous Help Line:** Private chat with trained volunteers.
- **Events & Campaigns:** Awareness programs and empowerment drives.
- **NGO & Government Integration:** Collaboration with social initiatives supporting women's causes.

11. Additional Modules

A. Smart Safety Integration

- **Smart Band/Watch Link:** Connects wearable devices for instant SOS.
- **Voice Command SOS:** "Help Me" voice recognition for hands-free activation.
- **Auto-Recording Mode:** Starts recording audio/video during emergencies.

B. AI & Data Insights

- **AI Chat Assistant:** Guides users on safety, health, and legal rights.
- **Crowdsourced Safety Index:** Users rate areas as "safe" or "unsafe."
- **Predictive Analytics:** Warns users about high-risk areas using crime pattern data.

C. Social Awareness Zone

- **Success Stories Section:** Inspiring stories from empowered women.

- **Digital Library:** E-books and articles on leadership, confidence, and self-defense.
- **Volunteer Program:** Connects women with local or global volunteer work.

12. Technical Specifications

- **Frontend:** Flutter / React Native (for Android, iOS, and Web)
- **Backend:** Node.js / Django REST Framework
- **Database:** Firebase / PostgreSQL
- **Cloud Platform:** AWS / Microsoft Azure
- **APIs:** Google Maps API, Twilio (for SMS), OpenAI (for chatbot)

Security

- End-to-end encryption
- Role-based authentication
- Encrypted cloud backups
- Two-factor verification

AI Tools

- Machine Learning for pattern recognition
- Predictive safety analytics
- Natural language processing for chatbot communication

13. System Architecture

- **User Interface Layer:** Mobile and web portals
- **Application Logic Layer:** Controls workflows (SOS, jobs, health, etc.)
- **Database Layer:** Stores user profiles, alerts, and analytics
- **Security Layer:** Manages authentication, data privacy, and encryption
- **API Gateway:** Connects external systems for maps, messaging, and analytics

14. User Roles

- **User (Women):** Access to all app features
- **Admin:** Manages user accounts and system analytics
- **Health & Legal Experts:** Provide professional guidance
- **NGO Partners:** Manage campaigns and events

15. User Interface (UI) Modules

- **Home Screen:** Dashboard with quick access buttons (SOS, Learning, Health, Jobs)

- **Safety Tab:** Map view, SOS button, and trusted contacts

- **Health Tab:** Tracker, doctor chat, and articles

- **Career Tab:** Job listings, freelancing options, and resume builder

- **Community Tab:** Forums, mentorship, and legal help

- **Profile Section:** Settings, privacy options, and subscription details

16. Future Enhancements

- **Blockchain-Based Data Security** for complete privacy protection

- **AI Emotion Detection** through facial and voice analysis

- **Offline Emergency Alerts** using Bluetooth mesh networks

- **Law Enforcement Integration** for direct emergency dispatch

- **AR-Based Self-Defense Training**

- **Virtual Job Fairs & Networking Events**

- **Multi-Language Voice Chatbot** for accessibility

- **Emergency Drone Dispatch System (R&D)**

17. Expected Impact

- Improved safety awareness and emergency response.

- Increased education and employment participation.

- Enhanced mental and physical well-being.

- Stronger community connections.

- Measurable progress in women's empowerment and equality.

18. Conclusion

Femsheild stands as a technological pillar for women empowerment — integrating safety, education, health, and financial growth into one powerful platform.
It envisions a future where **technology and compassion unite** to create a **safe, confident, and connected world for women**.