# Agati - A Personalized Women's Safety and Empowerment App

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**Abstract - Security concerns and the empowerment of women remain highly pressing challenges in India, with significant issues evident across urban, semi-urban, and rural regions alike. Women's mobility is often constrained by the fear of harassment, crime, and social barriers which slows down their movement toward true empowerment. To address these problems, this study focuses on the major drivers of women's safety and empowerment which include social norms, presence of crime, supportive structures, and women participation in technology.**

**To address these problems, this paper proposes an android application - Agati that offers safety and empowerment features tailored for women. Agati empowers women through AI safety alerts, location tracking, community support, and financial literacy modules designed to make them feel secure and empowered. This research seeks to understand how technology can close the gap between security and empowerment and build Agati as a personalized data-driven solution for women. The app integrates AI-driven safety alerts, location tracking, community support networks, and financial literacy modules to instill a sense of security and promote economic independence and social power. By leveraging data analytics and user feedback, Agati seeks to understand how technology can create a safe and supportive environment, addressing the multifaceted aspects of women's empowerment.**

**Keywords—Women Safety, Emergency SOS Alerts, Real-time Location Tracking, Fake Call Feature, Emergency Contacts Management, Nearby Police Stations, Mobile Application Security, Event hosting, Event Recommendation System, Discussion Forum, Navigation Chatbot, Online one on one sessions.**

## 1 Introduction

Issues surrounding women's empowerment and safety remain critical in India, with millions of women across urban, semi-urban, and rural areas facing violence, abuse, and harassment. These threats hinder education, mobility, and economic advancement, creating a self-perpetuating problem. Despite social and legal efforts, achieving a world where women move freely without fear still seems distant. Statistics emphasize the urgency: 35% of women experience harassment in public spaces according to NCRB and WHO [7][14], and 84% of harassment victims are students and working women aged 25–35 [21]. Increased employment in industrial and commercial sectors has further raised women's exposure to risks, especially during late-night travel [9]. Rising cases of sexual abuse and domestic violence underline the need for direct protection measures [3][14].

Mahalakshmi et al. (2024) highlight AI's role in promoting women's safety and empowerment through personalized training, safety reporting, and predictive analysis. Their study supports the implementation of safety apps, surveillance, and virtual assistance for women employees [18]. To address these challenges, we introduce Agati: a digital platform aimed at holistic women empowerment and safety [3][8][10]. Agati offers features like self-defense videos, emergency alerts, real-time location tracking, and mentorship opportunities [1][4][5][6]. It also bridges the gap by providing financial literacy and entrepreneurship programs, promoting long-term empowerment [10].

More than just an app, Agati seeks to shift societal paradigms using AI-enabled risk assessments, geo-fencing, and data analytics to enhance women's safety and independence [5][6][7][9]. In rural and underserved regions, Agati extends vital services and community support, tackling the digital divide [8][19]. Our mission is to dismantle barriers to women's freedom and autonomy by offering resources that promote self-reliance, confidence, and a secure future [3][8][10].

## 2 Technological Innovations for Women's Safety and Empowerment

Recent technological advancements have significantly boosted systems aimed at improving women's safety and empowerment. These solutions address issues like gender-based violence, inequality, limited resources, and digital exclusion. On the safety front, mobile apps and smart devices now offer real-time GPS tracking, SOS buttons, geofencing, fake call triggers, and direct links to police or emergency services. Wearable devices like smart bands further enhance discreet, immediate safety options.

In terms of empowerment, technology provides platforms for career development, financial literacy, entrepreneurship support, and community engagement. AI and ML personalize educational content and skill-building programs, making them more accessible and effective. Women-led initiatives are leveraging these tools to create digital marketplaces, mentorship networks, and training hubs that foster economic independence.

Additionally, AI-powered chatbots and voice assistants help bridge digital literacy gaps, guide users through services, and assist with government scheme applications—especially in underserved communities. Multilingual support ensures broader accessibility. The convergence of mobile tech, AI/ML, and user-centric design is creating impactful, inclusive systems that not only offer immediate safety but also promote long-term empowerment, helping women lead safer, more independent lives.

### 2.1 Challenges in Women's Safety and Empowerment

#### Prevalence of Gender-Based Violence and Harassment

Gender-Based Violence (GBV) encompasses harmful acts like physical abuse, sexual assault, psychological manipulation, and economic deprivation, rooted in systemic inequality and power imbalances [3]. Common forms include domestic violence, sexual harassment, cyberbullying, stalking, and workplace discrimination, severely impacting women and gender minorities.

Globally, about 35% of women experience harassment in public spaces, highlighting the urgent need for safety solutions [14]. Data from NCRB and WHO show GBV is particularly prevalent in urban areas such as transport hubs, marketplaces, and streets, where anonymity and poor surveillance embolden offenders [7].

Beyond immediate harm, GBV causes lasting psychological effects like PTSD, anxiety, and depression [8]. Socially, survivors often face stigma, isolation, victim-blaming, and restricted mobility, limiting their freedom and access to public spaces [7].

#### Limitations of Existing Safety Mechanisms

Traditional safety mechanisms, including police helplines and legal systems, often fail to provide timely protection due to bureaucratic delays, resource shortages, and inefficient response times [4]. Community watch programs, while intended to enhance safety, lack real-time surveillance and effective coordination with law enforcement, limiting their impact [7]. Additionally, social stigma discourages many women from reporting GBV cases, fearing

blame or disbelief [3]., and distrust in police further reduces reliance on official protection [14]. Although some safety apps offer geofencing and location-based alerts, their limited integration with law enforcement and slow emergency response times weaken their effectiveness [5][6].

### 2.2 Technology-Driven Approaches to Women's Safety

#### AI, IoT, and Blockchain: Technological Solutions for Women's Safety

Given the limitations of traditional safety mechanisms, technology-driven solutions provide a proactive approach to enhancing women's security. AI-powered predictive analytics analyze crime data, user movement, and community reports to identify high-risk areas [5][6][9]. ML models detect anomalies like sudden route deviations, improving risk-aware navigation and optimizing law enforcement patrols through AI-generated heatmaps [5][9][10]. Faster emergency response is enabled by AI-assessed risk levels [4][6][9].

IoT-based safety devices address mobile app limitations by enabling hands-free distress signals through smart wearables like wristbands and shoes [17][22][25]. GPS tracking and biometric sensors detect abnormal patterns, ensuring real-time alerts for faster intervention [5][17][22][26].

Blockchain enhances security by preventing data tampering and enabling anonymous reporting [5][8][10]. Its decentralized framework ensures immutable records, protecting legal evidence and automating report escalation for quicker action [5][9]. By fostering transparency, blockchain strengthens legal accountability and community-driven safety initiatives [5][8][10].

#### Impact and Effectiveness of Women's Safety Apps

Women's safety apps incorporate diverse features to enhance security, emergency response, and user accessibility. "FearlessShe" [1]. offers SOS alerts, a fake call function, and a safety check-in system, with plans for AI-driven safety predictions. "TECHNOLOGY 100" [2]. ensures cross-platform compatibility, integrates real-time location sharing, and utilizes QR codes for public transport tracking. "SafeSteps" [3]. emphasizes user-centered design with geo-fencing, live tracking, and route deviation detection. "SAKHII" [4]. prioritizes ease of use with one-tap emergency alerts and GPS tracking. "WOMEN SAFETY-SAVIOUR" [5]. employs Arduino-based technology for GSM-based emergency communication and shake-to-alert functionality. "Women Safety App" [6]. focuses on streamlined emergency response and user-friendly accessibility. Table 1. provides a comparative analysis of various women's safety apps based on key aspects such as safety features, user-centered tools, technical implementation, and privacy & security.

| Paper | Study Focus | Safety Features | User-Centered Tools | Technical Implementation | Privacy & Security |
|---|---|---|---|---|---|
| [1]FearlessShe | Women's safety app with emergency support | SOS, live location tracking, fake calls, emergency contacts | Self-defense tutorials, safety tips | Android Studio, Firebase for real-time data | Focus on secure data storage |
| [2]Technology100 | Safety app with geofencing integration | Live location tracking, QR vehicle scanning, distress alerts | Chatroom for users | Cross-platform (Flutter-based) | Not emphasized |
| [3]SafeSteps | Safety app with route monitoring | SOS alerts, live location tracking, safe zone system | Community-driven reporting | Android app | No details |
| [4]SAKHII Safety App | Self-defense & emergency services app | SOS, GPS tracking, direct emergency services access | Self-defense guides, awareness features | Not stated | No security information |

| Paper | Study Focus | Safety Features | User-Centered Tools | Technical Implementation | Privacy & Security |
|---|---|---|---|---|---|
| [5] Women Safety-Savior | Panic-alert safety system | GPS tracking, auto messaging to emergency contacts | No interactive components | Android application with SMS support | No security policies noted |
| [6] Women Safety App | Location tracking & emergency contact alerts | SOS, distress signals, emergency call access | No interactive community features | Mobile application | No security details |

**Table 1.** Comparison of Existing Women's Safety Solution.

### 2.3 User Adoption and Engagement

Ensuring widespread adoption of women's safety apps requires addressing privacy concerns, usability challenges, and ethical considerations. Many women hesitate to use these apps due to fears of data misuse, lack of digital literacy, and cultural restrictions in certain regions [1][5][8][19]. Simplified interfaces and privacy-focused features, such as anonymous modes, can improve trust and accessibility [1][5][8].

However, many apps remain ineffective in emergencies due to complex activation steps or incompatibility with low-end devices [5][19][25]. Features like voice-activated SOS and lightweight designs ensure that women can access safety tools regardless of technical limitations [5][19].

Moreover, real-time tracking raises ethical concerns, requiring strong encryption and user control over data sharing [1][5][8]. Transparent policies on data storage and usage can enhance trust, encouraging broader adoption and making safety apps more effective in real-world scenarios [5][8].

### 2.4 Community and Awareness Initiatives

#### Community Engagement and Crowd-Sourced Safety Networks

Ensuring widespread adoption of women's safety apps requires trust, usability, and strong privacy safeguards [1][5][8]. However, technology alone is insufficient—community-driven efforts are essential. Traditional crime databases often lack real-time updates, but crowdsourced networks fill this gap by enabling users to report harassment hotspots and suspicious activities, creating dynamic risk maps [6][7]. Community alerts also allow faster peer intervention, addressing delays in emergency response [6][7]. Public-private partnerships integrate technology, law enforcement, and victim support for a more coordinated protection system [10].

Accessibility challenges persist, especially for differently-abled individuals, elderly users, and rural communities [19][22]. Features like voice commands, large text, haptic feedback, physical SOS buttons, multi-language support, and voice-based interactions enhance usability and adoption [8][19][22].

Beyond emergency alerts, integrating legal aid and counseling directly into safety apps provides survivors with essential post-crisis support, reducing stigma and simplifying reporting [10]. Together, real-time collaboration, inclusivity, and survivor assistance build a stronger, community-driven safety ecosystem [8][10][19][22].

#### Training and Awareness Programs

Building on community-driven safety efforts, training and awareness programs are vital for the effective use of AI-driven safety tools. AI-powered chatbots and platforms enhance self-defense education and digital literacy, especially in vulnerable communities [11]. Corporations and universities are embedding safety features into workplace and campus apps to reinforce protection [8][10]. However, socio-cultural barriers and limited digital skills hinder adoption. Government collaborations, developer partnerships, and public awareness campaigns help bridge these gaps [10]. Targeted training programs boost AI adoption, empowering women entrepreneurs by

improving digital literacy and addressing cultural challenges [28][30]. Context-aware, inclusive training ensures broader access and fosters a safer, digitally empowered environment for women [27][29].

Table 2. provides an overview of AI/ML-driven initiatives in women's empowerment, categorizing them based on key aspects such as areas of empowerment, technologies used, methodologies applied, key findings, challenges discussed, and implementation scope. The table highlights how AI/ML technologies are leveraged to enhance opportunities in education, employment, and safety while also addressing existing challenges in adoption and scalability

| **Paper** | **Area(s) of Empowerment** | **AI/ML Technologies Used** | **Methodology** | **Key Findings** | **Challenges Discussed** | **Implementation Scope** |
|---|---|---|---|---|---|---|
| [7] AI & Online Learning for Women's Empowerment | Education | AI in Adaptive Learning, Safety, Leadership | Quantitative Survey | AI education improves access but faces infrastructure challenges | Digital literacy, accessibility | Global |
| [8] EmpowerHerAI - Leadership & Career Tools | Career Development | Gender-Balanced Recruitment (GBR), Inclusive Leadership Index (ILI), Mentorship Matching Algorithm (MMA) | Algorithm Design Description | AI-driven mentorship and recruitment systems improve gender diversity | Bias mitigation in AI hiring | Workplace applications |
| [9]. AI-Powered Mentorship for Careers | Career Development | NLP, AI-driven Recommendations | Concept Design | AI-driven mentorship transforms career development strategies | Requires trust, algorithm refinement | Global |

**Table 2.** Literature Survey for Empowerment Apps

## 3 Proposed System

Building upon the literature survey, the proposed system integrates AI-driven safety tools, digital literacy programs, and structured mentorship to enhance women's security and empowerment. This role-based architecture categorizes users into Normal Users, Entrepreneurs, Admins, and Trainers, each with distinct responsibilities.

Normal Users engage with two key modules: Safety, which includes fake call simulation, location tracking, SOS alerts, and real-time risk assessments using crowd-sourced data [6][7][11], and Empowerment, providing event participation, Q&A forums, and AI-driven entrepreneurship training [28][30]. Entrepreneurs mentor Normal Users, leveraging AI and digital platforms to bridge the digital divide and foster business development in underrepresented communities [27][29]. Admins oversee system functionality, ensuring seamless operations, while Trainers conduct self-defense and digital awareness programs using AI-driven personalized learning models [11].

The system operates on Firebase authentication and a centralized database, ensuring secure role-based access. By integrating community engagement, AI-powered interventions, and public-private partnerships, the platform enhances safety response times, supports women-led startups, and fosters digital inclusivity [6][10][19]. This self-sustaining ecosystem bridges technology and policy, making security tools, business education, and digital literacy widely accessible, ensuring scalability and real-world impact.

Agati's AI-powered safety alerts, real-time tracking, and predictive risk assessment transform it from a reactive panic-button tool to an intelligent, context-aware safety ecosystem. To address potential challenges, measures are incorporated to minimize false positives in AI alerts through adaptive learning models that refine sensitivity based on user feedback. Recognizing issues like smartphone access and unreliable networks in rural areas, Agati provides offline fallback options such as SMS-based SOS and ensures compatibility with low-end devices. To overcome social stigma related to women's tech use, community awareness initiatives and collaborations with local NGOs are planned. These strategies ensure that Agati remains both technologically innovative and socially practical.

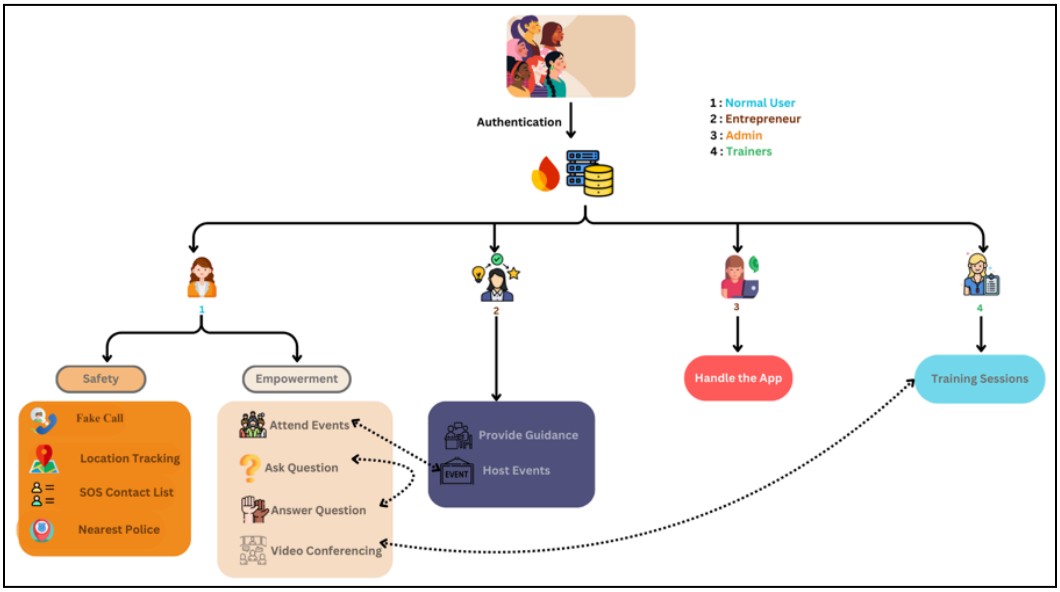


**Fig. 1.** System Design of Agati: A Role-Based Safety and Empowerment Architecture

### 3.1 Safety & Empowerment Features

Agati's core mission is to ensure women's safety in both online and offline environments through practical, real-time tools. The app features a Fake Call option that simulates an incoming call, allowing users to exit uncomfortable or dangerous situations discreetly. Live Location Tracking lets users share their real-time location with trusted SOS contacts, ensuring their safety during travel or emergencies. Additionally, Agati integrates Google Maps to fetch and display the nearest police station, enabling users to quickly find and navigate to law enforcement support. The SOS Contact List allows users to save emergency contacts, who receive instant alerts with the user's live location and a preset message during critical moments. Together, these tools offer a strong safety net, boosting women's confidence and security.

Beyond safety, Agati focuses on empowering women by providing access to resources, communities, and opportunities. Through the Event Hosting and Booking Module, entrepreneurs can organize events and workshops, while users can browse and attend these events physically or virtually, fostering skill-building and networking. A

Machine Learning-based Recommendation Model suggests events tailored to users' interests and activity history. Users can also book One-on-One Video Conferencing Sessions for personalized mentorship or training with professionals and entrepreneurs, supporting their individual growth.

The app includes an Open Discussion Forum where users can post questions, share insights, and engage in discussions on various topics, from safety tips to career guidance, helping build a strong community. To further simplify navigation, Agati features a Chatbot Assistant that helps users find events, schemes, and offers basic support for using the platform.

### 3.2 Proposed Evaluation Metrics for Agati App Performance

To ensure the Agati app delivers a high-quality, secure, and user-centric experience, the following evaluation metrics are proposed for implementation and assessment once the system is fully developed:

**Functional Performance Metrics**
Location Accuracy will ensure real-time tracking within 10–20 meters across various environments. SOS Response Time aims for alert dispatch within 3–5 seconds, and Fake Call Activation should trigger within 3 seconds. Recommendation Accuracy for event suggestions will be evaluated using precision, recall, and F1-score to maintain relevance and personalization.

**Performance Metrics**
App Launch Time will be optimized to under 3 seconds. API Response Time will stay below 500 milliseconds, and Database Query Execution will complete within 1 second for swift data access. Video Conferencing Latency will be kept under 300 milliseconds for smooth communication.

**User Experience (UX) Metrics**
The app targets a System Usability Scale (SUS) score above 80, a Crash-Free Rate of 99.99%, and Battery Consumption under 5% per 30 minutes of usage to ensure a stable and user-friendly experience.

**Scalability**
The app will be tested for Scalability and Load Handling, ensuring consistent performance and fast response times even during peak usage and as the user base grows.

## 4 Results

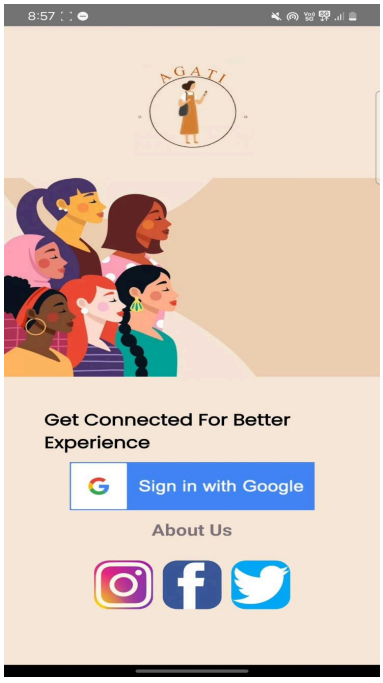


**Fig. 2.** Login Page

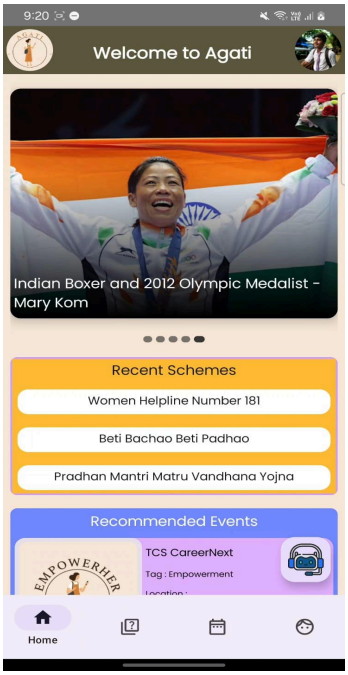


**Fig. 3.** Home Page


**Fig. 4.** Safety Features

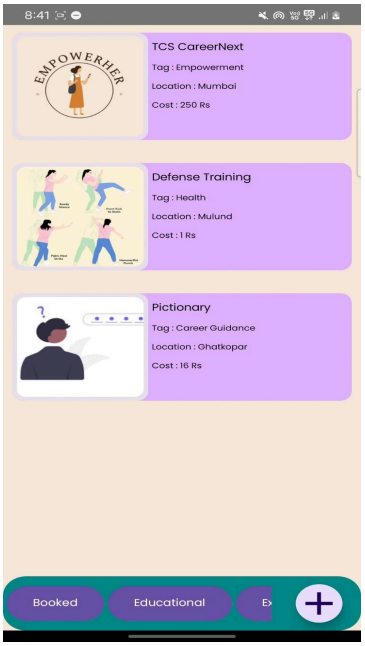


**Fig. 5.** Events Page


**Fig. 6.** Open Forum


**Fig. 7.** Video Conferencing

## 5 Conclusion And Future Scope

Agati's empowerment module covers financial concepts such as budgeting, savings, digital payments (UPI, e-wallets), personal finance basics, entrepreneurship funding, and government assistance schemes. Content personalization is driven by onboarding preferences and user behavior, with an AI recommendation engine tailoring financial education. Effectiveness is measured through feedback surveys, engagement metrics, and knowledge quizzes to track user learning and impact.

For law enforcement collaboration, Agati will integrate secured APIs for consent-based SOS data sharing, supported by partnerships with safety agencies to enable faster response times. Blockchain-backed audit logs and user feedback on response quality will ensure transparency, trust, and accountability.

Future innovation includes AR-based self-defense training for realistic, accessible practice, hands-free SOS activation via wearables for discreet emergencies, and blockchain-secured data protection for enhanced privacy. Multilingual support and global rollout plans will broaden reach, while community-driven safety mapping will empower users with real-time risk insights.

Agati's AR-based self-defense training will work on standard smartphones using built-in cameras and sensors, without needing any additional hardware. Enhanced experiences will be available on AR-compatible phones, but no external devices are required, ensuring accessibility for all users.

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