



RESEARCH ARTICLE

Smart alerting services: Safeguarding women and children in the digital age

G. Gayathri Devi*, R. Radha

Abstract

In the digital age, safeguarding women and children has become increasingly challenging due to the pervasive nature of cyber threats and the rapidly evolving environments in which they live. This paper investigates the role of smart alerting services in enhancing the protection of these vulnerable groups. It focuses on the functionality of existing safety apps, including features like real-time location tracking, emergency alert systems, and geofencing. By analyzing various case studies and technologies, it highlights how these services address safety concerns, their effectiveness, and the challenges faced in their deployment. The research provides insights into how smart alerting systems contribute to personal safety and the potential for future advancements in this field.

Keywords: Child Safety Solutions, Digital Safety, Mobile Safety Apps, Safe Zones Technology, Women Protection.

Introduction

The research emerges from growing concerns about the safety and well-being of women and children in the digital era. Information and communication technology (ICT) has profoundly benefited billions worldwide by bridging gaps and enhancing human potential in various fields. However, as ICT advances, so does the reach of cybercrime. Cybercrimes pose significant threats to individuals, with an alarming rise in crimes against women, who are increasingly victimized in cyberspace.

Social networking websites (SNWs) have become popular among educated, independent, modern women of the 21st century, reflecting the transformation brought about by technological advancements. While technology has revolutionized human life, it has also redefined the nature of cybercrimes.

Women make substantial contributions across diverse sectors, including space exploration, information technology, healthcare, agriculture, and sports. Despite these contributions, their safety remains a major concern, both day and night. In 2019, India reported a rape every 16 minutes. Notable cases include the brutal gang rape of a young medical student in New Delhi in late 2012, who died from her injuries two days later, and the 2021 National Crime Records Bureau (NCRB) report, which recorded 31,677 rape cases nationwide—an increase from 2020 and 2019. Rajasthan, Madhya Pradesh, and Uttar Pradesh were reported as having the highest numbers of rape cases. In 2022, the police recorded 31,516 rape cases, marking a 20% increase compared to 2021, according to the National Crime Records Bureau. Ajmer's rape involving over a hundred underage schoolgirls and the 2013 gang rape of a 22-year-old photojournalist in Mumbai highlights the severity of sexual violence. On 1 November 2023, a 22-year-old B. Tech student from IIT-BHU was reportedly ambushed, stripped, and gang-raped in Banaras district, Uttar Pradesh, India. The perpetrators allegedly filmed the assault at gunpoint. On 9 August 2024, the body of a 31-year-old trainee doctor was discovered with multiple injuries at a government teaching hospital in Kolkata.

Women in poverty, rural areas with limited education, and those from scheduled castes and tribes face the highest rates of sexual assault. Marginalized populations are particularly vulnerable due to their circumstances, including impoverished living conditions, lack of access to safe sanitation, and isolation.

Department of Computer Science, Shrimathi Devkunvar Nanalal Bhatt Vaishnav College for Women, Chennai, Tamil Nadu, India.

***Corresponding Author:** G. Gayathri Devi, Department of Computer Science, Shrimathi Devkunvar Nanalal Bhatt Vaishnav College for Women, Chennai, Tamil Nadu, India, E-Mail: mail2gg@yahoo.co.in

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Cybercrime is a growing and pervasive threat that infiltrates any device connected to the internet. As reliance on technology increases, so does the risk of cybercrime. Despite the benefits of the internet, its potential for misuse is equally significant, making society increasingly vulnerable to its impacts.

Literature Survey

The study introduced an automated method for creating malware ontology rule sets. This technique involves analyzing the behavioral patterns of malicious software using a formal extended description method, which focuses on the frequency and combinations of API calls (Chenghua *et al.*, 2024). By applying association rules and decision trees, the authors extract behavioral traits from malicious programs to develop a detailed and refined rule set for classifying different types of malware. The rule set is then semantically transformed using the SWRL rule language. Furthermore, a coarse-grained classification of program behavior rules is achieved through the Fisher linear discriminant algorithm. The resulting malware ontology rules are generated at a rate of 10.08 pieces per second, with a detection rate of 89.92% for previously unknown samples.

Adolescents often communicate electronically with their peers, sometimes sharing inappropriate images that can have serious repercussions. This raises a critical issue: how should the criminal justice system address such behavior? Traditional child pornography laws may be considered too severe and punitive for these situations. Nigel (2013) explores recent trends in the United States and analyzes how this type of juvenile behavior is handled under the law, policy, and practices in England and Wales.

The research examines how to tailor existing process models to the specific needs of higher education institutions. With the growing availability of computing resources and internet access for students, employees, and the public, there is an urgent need for organizations to implement and maintain robust cyber forensics analysis policies (Rabail *et al.* 2015). This includes establishing a detailed procedure for reporting and managing cybercrime incidents.

The study outlined three main objectives: first, to identify the digital threats and risks faced by women entrepreneurs in their daily online interactions; second, to analyze the security weaknesses in the privacy policies of popular platforms; and third, to provide evidence that supports women's legitimate concerns about their security and privacy in online communities and virtual environments like social networking sites (Michota 2013). The study shows that these platforms often fail to protect user privacy adequately, as they lack sufficient security measures, leading to the exposure of personal data to unauthorized individuals.

The researchers introduce a security and safety assessment framework employed in the development of internet-based control systems. Building upon established

measures for physical and network security, such as firewalls and robust user-authorized access control, the framework outlined in this paper specifically addresses the security aspects of control commands transmitted over the internet, counteractions against malicious attacks, and overall system safety (Yang *et al.* 2007). The application of this framework is demonstrated through a case study involving an internet-based control system for a process rig.

In this study, the authors introduce a women's safety device called SafeWomen, offering a novel approach to mitigate crimes targeting women (Sumit *et al.*, 2021). The device aims to enhance women's security in unsafe scenarios by transmitting an alert containing the geographical location and an emergency message to pre-registered contact numbers, thereby facilitating timely assistance to prevent incidents. Additionally, the system has the capability to track the victim's current location based on the IP address of the device in use. This system is not limited to women alone and can be adapted to ensure the safety and security of children and elderly individuals by adjusting the system's functionality accordingly.

The authors propose a new method for enhancing women's security that they argue is more effective than current solutions. Their system (Nivetha *et al.* 2019) is built around an Arduino microcontroller and includes components such as GPS, GSM, a watch, a shockwave generation circuit, and an accelerometer to strengthen security measures.

The researchers introduce an intelligent security system designed to protect women who frequently face incidents of physical harassment globally. The rise in such incidents is often linked to the lack of effective surveillance systems. This project aims (Remya *et al.* 2014) to tackle this problem by offering a comprehensive solution. The system features a monitoring device that processes data to detect unsafe environments. When such environments are identified, the system sends alerts to nearby control rooms and activates alarms in strategic locations to seek help. It is especially suited for use in public areas such as railway stations, bus stands, footpaths, and shopping malls, where women are often targeted. The paper asserts that this initiative could significantly improve safety and contribute to a world where people can move about without fear.

The literature review examines the dynamics of trust in online networks focused on child exploitation. By systematically analyzing twenty-one studies, the review reveals the complex nature of communication within these networks, which ranges from seeking validation to accessing illegal materials (Kloess and van der Bruggen's, 2023). Building trust in the dangerous environment of the Dark Web proves essential as users navigate threats and limited information. The review also discusses implications for future research and intervention strategies, providing valuable insights for effectively addressing online child exploitation.

The review discussed the limited research on the livestreaming of child sexual abuse (LSCSA), which largely relies on case studies and law enforcement data from the Philippines. Inconsistent terminology, methodologies, and population criteria hinder the accurate assessment of LSCSA's global prevalence (Drejer *et al.*, 2024). The COVID-19 pandemic has intensified the issue by increasing internet use, emphasizing the need for more in-depth research. The lack of a legal definition for LSCSA complicates both prosecution and support for victims. Moreover, challenges such as the involvement of older offenders, privacy issues, and insufficient research on the psychological effects further impede efforts to combat LSCSA.

Since 2008, The Onion Router (TOR) browser has provided anonymity on the darknet by routing traffic through a worldwide network of servers, attracting a diverse user base including journalists, dissidents, and criminals (Gannon, C 2023). Many darknet forums are dedicated to the distribution of child sexual abuse materials (CSAM), fostering global communities with low risk of detection. Managed by key individuals, these forums are central to CSAM transactions. There is a notable lack of effective measures to prevent access to CSAM sites, underscoring the need for coordinated efforts among law enforcement, academic institutions, technology providers, and non-governmental organizations (NGOs).

Rapid technological advancements have yielded many benefits but also brought significant challenges, with cybercrime targeting women being a major concern. The widespread use of the internet has accelerated the growth of cybercrime, manifesting in various forms of violence, including physical, sexual, and psychological abuse (Amit Singh, 2022). Women and girls are especially vulnerable due to perceived weaknesses, and this violence extends beyond the digital realm into physical spaces such as streets, workplaces, and homes. The broad reach of cybercrime across platforms like social media, messaging apps, emails, and dating sites requires a comprehensive approach to address both online and offline dimensions, leveraging technological innovations to safeguard women's well-being.

Origin of the Research

This proposal originates from the vital issue of "safety" for women and children worldwide. In public spaces, women frequently encounter harassment, abuse, and violence, fostering a fear of venturing out alone or engaging in activities beyond the home. The COVID-19 pandemic has further intensified these challenges, with many women experiencing increased violence and harassment within their own homes. In response, researchers and developers have increasingly turned to technology to address these safety concerns.

The aim of this research is to know about security

applications designed to enhance women's well-being in public spaces. These applications will feature several key components to help women stay safe, including a real-time tracking system, an emergency alert function, and information about safe and unsafe areas.

Several factors underscore the importance of this research:

- *Rising cybercrime*

Cybercrime is escalating at a concerning rate, with women being the primary targets. Smartphones and the Internet provide predators with anonymous and easy access to exploit women and girls. Research indicates that women use smartphones for over four hours a day and are more prone to smartphone addiction compared to men.

- *Smartphone usage patterns*

Women predominantly use smartphones for social networking and online shopping rather than for calls, games, or web searches.

- *Smartphones as essential tools*

Smartphones have become integral to daily life. Losing or misplacing a phone can pose significant risks, as sensitive data may fall into the hands of cybercriminals. By examining installed apps, anyone can deduce the user's age, gender, location, fitness interests, potential medical conditions, and even pregnancy status.

- *Children's vulnerability*

Children are particularly vulnerable to cyber threats due to their high levels of trust and limited cybersecurity knowledge. Cybercriminals frequently target children and teenagers in chat rooms, social media platforms, video streaming sites, and online video games where they are most active.

Research Flow

This research aims to achieve two primary goals: first, to analyze and evaluate existing mobile applications focused on women's personal safety and determine how effectively smartphones enhance their security; and second, to propose an idea to develop a new mobile application that provides a reliable tool for improving women's safety in potentially dangerous situations.

Existing Safety Apps

112 India

Launched by the Central Government of India, the 112 India app is designed as an all-in-one women's security application. Its core feature is a single-tap SOS alert system, which allows users to quickly issue an emergency call with just one click. The app's primary objective is to provide women with a reliable emergency contact number for any distress situation.

My safetipin

This app uses data mapping techniques to enhance women’s safety in public spaces. It helps users choose safer routes by alerting their loved ones if they deviate from the planned path. The app assesses the safety of various areas and notifies users and their contacts if they enter locations with low safety scores.

Sheroes

Sheroes is a multifaceted app that supports women by allowing them to share their interests through videos and posts, receive career advice, access a free women’s helpline, find and share recipes, connect with others, get free legal and beauty advice, discover work-from-home opportunities, and explore reselling options.

bSafe

The bSafe app aims to prevent crimes such as violence and sexual assault while also providing evidence in the aftermath of such incidents. It features an SOS button that sends an immediate alert along with the user’s live location to designated contacts.

Smart 24x7

This app enables users to send emergency alerts to family and friends and contact local fire, police, and ambulance services. By pressing the PANIC button, users can send distress messages to up to five primary contacts, regardless of their phone model.

Himmat

Developed by the Delhi police, Himmat is tailored for women traveling late at night. It allows registered users to send SOS alerts to their registered numbers and includes a feature that transmits audio and video footage of the situation to the police control room.

Women’s safety

This app offers three alert levels: green for safe, orange for caution, and red for emergency situations. Users can tap the appropriate button to send their location, a Google Maps link, and two photos (front and rear) to preconfigured email addresses.

Safe UP

Safe UP aims to ensure women’s safety everywhere through features like guardian calls, safety checks, safe zones, community chats, and guardian training. The app is designed to support and protect women in various scenarios.

Shake 2 Safety

This app is designed for situations where manual interaction might be difficult. Users can shake their phones to automatically send their location, audio recording, photos, and messages to selected contacts.

Police nearby

This app helps users locate the nearest police stations using their GPS location. It is particularly useful during emergencies such as thefts or robberies, providing quick access to local law enforcement resources.

UrSafe

UrSafe offers a wide range of features, including follow-me options, safety checks, live streaming, fake calls, emergency SOS alerts, voice activation, and geo-located 911 services. By setting up a profile, users can access these safety tools to enhance their personal security.

Each of these apps provides unique features aimed at improving personal safety and security, catering to different needs and scenarios faced by users.

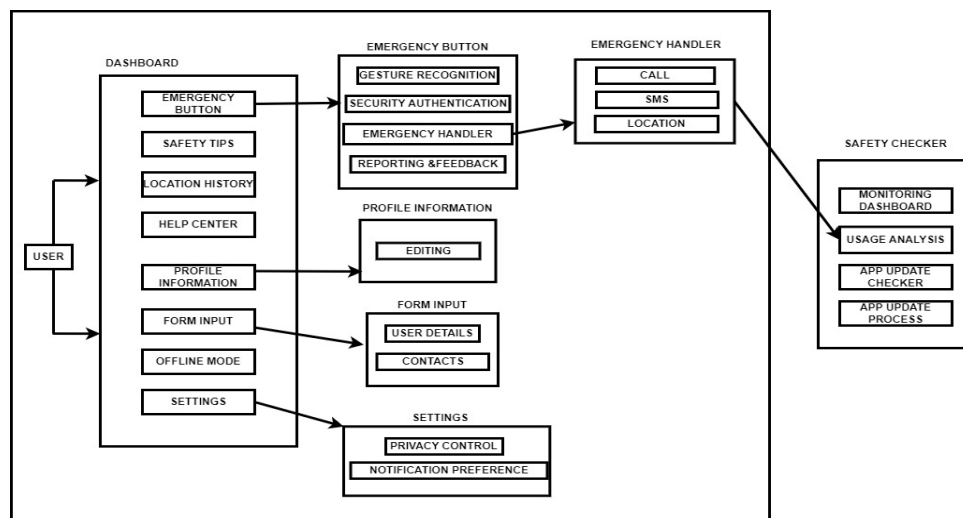


Figure 1: Generalized architecture for a women’s safety app, highlighting key components and their interactions

Workflow of Women and Child Safety App

Creating a women and child safety app is a valuable initiative to address safety concerns and provide a sense of security for users. The general architecture of safety for women and children is shown in Figure 1.

Current safety apps face several challenges that can impact their effectiveness, including privacy concerns, technical issues, and limited coverage. Privacy concerns are paramount, as these apps often collect sensitive personal data, such as location information and user activity. This data, if mishandled or breached, poses significant risks to user security and privacy. Technical issues also present a major challenge; software bugs, app crashes, and compatibility problems with various devices can undermine the reliability and functionality of safety apps. Limited coverage is another critical issue, particularly in areas with poor internet connectivity or weak GPS signals, which can impair the app’s ability to provide accurate real-time tracking and timely emergency alerts. These challenges highlight the need for ongoing development and enhancement of safety apps to address these vulnerabilities and improve their overall effectiveness in protecting users.

Child Monitoring App

The Child Monitoring app is a comprehensive tool designed to provide parents and guardians with the means to keep a watchful eye on the well-being and safety of their children in the digital age. This application offers a range of features, including real-time location tracking, app usage monitoring, and content filtering, ensuring parents can stay informed about their child’s online activities and physical whereabouts. With the capability to receive instant alerts for specific events or location changes, the Child Monitoring app provides peace of mind to caregivers, enabling them to

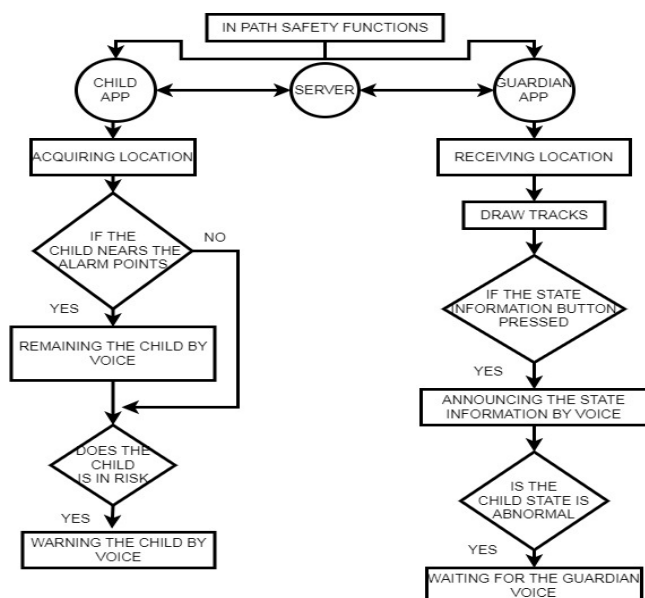


Figure 2: Child monitoring app

respond promptly to any potential concerns. Additionally, the app may incorporate features like geofencing, allowing parents to set virtual boundaries and receive notifications if their child enters or leaves predefined areas. By combining technological innovation with the fundamental need for child safety, the Child Monitoring app emerges as a valuable asset for parents seeking to strike a balance between allowing their children independence and ensuring their protection in today’s connected world. Figure 2 shows the workflow of the Child Monitoring app

Offline Mode App

The Offline Mode app dedicated to women and child safety is a forward-thinking tool designed to provide essential functionalities even in areas with limited or no internet connectivity. Recognizing that emergencies can happen anytime, anywhere, this application ensures that critical safety features remain accessible when an internet connection is unavailable. Whether it’s triggering emergency protocols, accessing safety resources, or sharing location information, the Offline Mode app empowers women and children to stay protected regardless of their location. By storing vital information locally on the device, the app ensures that users can initiate safety measures even in remote or isolated areas where connectivity may be compromised. This proactive approach to offline functionality enhances the reliability of safety features, offering a sense of security to users, especially women and children, in various situations where immediate assistance may be required. Figure 3 shows the workflow of offline mode.

Domestic Violence App

A domestic violence app serves as a crucial lifeline for individuals experiencing abusive relationships, offering support, resources, and empowerment. Designed with sensitivity to the unique challenges of domestic violence, this app provides a comprehensive range of features. Users can access educational content to understand the dynamics

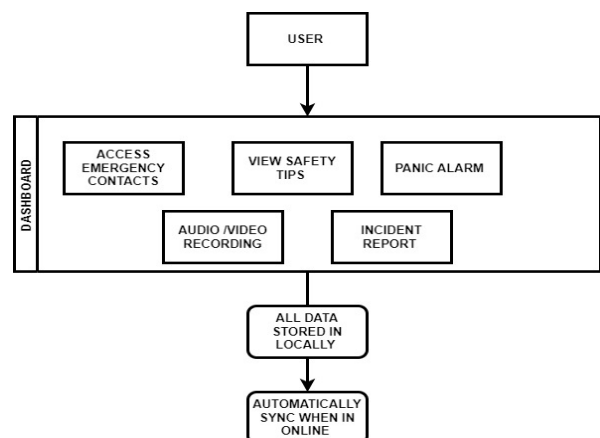


Figure 3: Flow of offline mode app

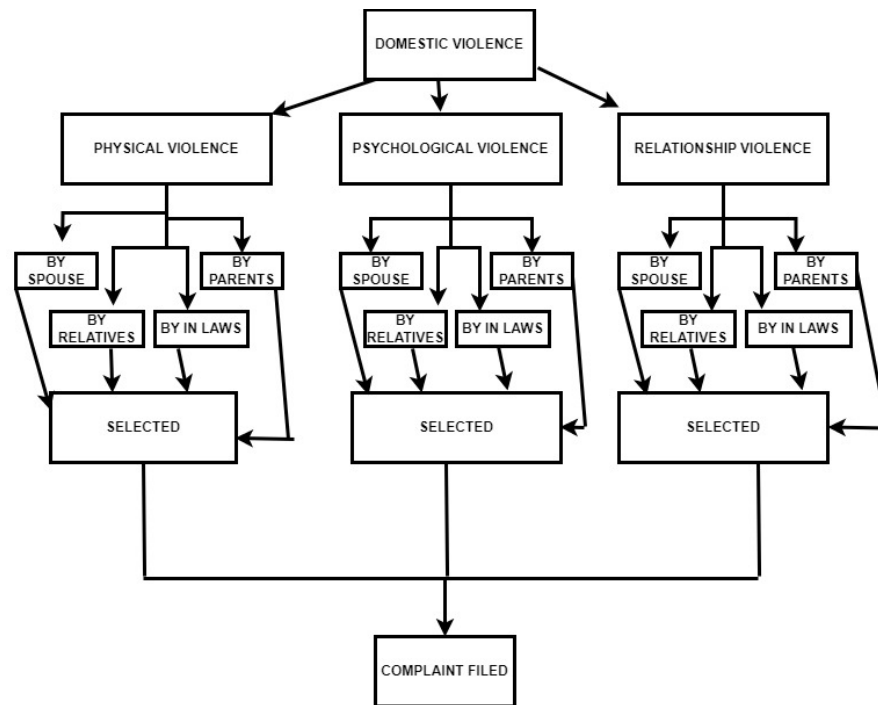


Figure 4: Flow of domestic violence app

of abuse, recognize signs of violence, and gain insights into healthy relationships. The app facilitates a personalized risk assessment, empowering users to evaluate the level of danger they may be facing. A crucial component is the creation of a tailored safety plan, outlining steps to take during incidents and providing immediate access to emergency contacts, including local hotlines and shelters. With discreet icons and features to prioritize user safety and privacy, the app also offers helpline and chat support, connecting users with professionals who can provide guidance and emotional support. Additionally, the app serves as a centralized resource hub, offering information on community resources, legal aid, and support groups. Figure 4 shows the workflow of the domestic violence app.

Case study of Existing app

Existing child and women safety apps play a crucial role in enhancing security and well-being through their real-time features. These apps provide continuous GPS tracking, allowing parents and guardians to monitor the precise locations of their children or loved ones, ensuring their safety. Emergency alert systems, such as SOS buttons, enable users to quickly send distress signals to trusted contacts or emergency services if they find themselves in danger. Geofencing capabilities allow users to set virtual boundaries and receive notifications if these boundaries are crossed, helping to track movements and ensure individuals remain in safe areas. Real-time communication tools within these apps facilitate instant messaging and calling, enabling users to connect with their contacts or seek help promptly.

Additionally, features for monitoring online activities and reporting incidents further bolster safety by preventing exposure to cyber threats and addressing unsafe conditions. By integrating these functionalities, child and women safety apps provide vital support, offering immediate assistance and enhancing overall protection in various scenarios. Table 1 shows the case study of the existing app.

Despite their benefits, existing child and women safety apps have several limitations that can affect their effectiveness. Privacy concerns are significant, as these apps often collect sensitive data, such as location information, which could be misused or breached. Coverage issues can arise in areas with poor internet connectivity or weak GPS signals, impairing the app's ability to provide reliable real-time tracking and emergency assistance. The effectiveness of these apps also depends on user compliance; if individuals do not consistently use or update the app, its functionality is compromised. Additionally, emergency alert features can sometimes lead to false alarms or accidental activations, causing unnecessary panic or straining emergency resources. Technical issues, such as software bugs or compatibility problems, can affect the app's performance and reliability. Many apps also struggle with integration into broader safety systems or emergency services, which limits their ability to coordinate comprehensive responses. Furthermore, cultural and linguistic barriers can reduce accessibility and effectiveness for diverse user populations. Finally, while some apps are free, premium features often come at a cost, and the need for a suitable smartphone can limit access for some users. These challenges highlight

Table 1: Case study of existing app

<i>App</i>	<i>Location</i>	<i>Background</i>	<i>Implementation</i>	<i>Outcome</i>	<i>Challenges</i>
SafeCity – Crowdsourced Reporting	India	Platform for reporting sexual harassment in public spaces.	Crowdsourced data collection, incident mapping, collaboration with authorities.	Improved safety through better policing and reduced harassment incidents.	Encouraging anonymous reporting and balancing data privacy with safety needs.
Angel Shot Initiative	USA	Safety protocol in bars for discreetly seeking help.	Codeword system where patrons order an «Angel Shot» to alert staff of a need for assistance.	Quick interventions in potentially dangerous situations.	Ensuring staff and patrons are aware of the code and proper staff training.
TraffickCam – Combating Human Trafficking	USA	App for crowdsourcing hotel room photos to aid in identifying trafficking locations.	Users upload photos of hotel rooms to a database for law enforcement matching.	Assisted in rescuing trafficking victims and identifying locations.	High-volume submissions and maintaining accurate image recognition technology.
Watch Over Me App	Malaysia	Personal safety app for women walking alone.	Timer-based alerts and emergency button for contacting contacts and authorities.	Enabled safe interventions and increased personal safety.	Ensuring app reliability in poor connectivity areas and maintaining user trust.
Smart Bracelet Initiative	Spain	Wearable device for women at risk of domestic violence.	Bracelet with a panic button sending alerts to police, including location and audio recording.	Prevented domestic violence incidents and arrests of perpetrators.	Ensuring durability, comfort, and overcoming initial resistance through awareness campaigns.
Smart Campus Safety – University of Johannesburg	South Africa	Safety system for university students, especially females.	Mobile app with SOS alerts, campus panic buttons, and smart CCTV cameras.	Improved campus safety and reduced gender-based violence incidents.	Adoption of the app and maintaining infrastructure, including regular maintenance.
Bark – Digital Safety for Children Online	USA	Parental control app for monitoring and protecting children online.	Machine learning algorithms to detect risks like cyberbullying, sending alerts to parents.	Prevented cases of cyberbullying, suicide attempts, and other online dangers.	Balancing monitoring with privacy, and adapting to evolving digital threats.
Noonlight – Instant Emergency Response	USA	Mobile app for instant emergency response.	Press and hold button sends alert and location to emergency responders; integrates with smart devices.	Quick response to prevent attacks and ensure safety.	Accurate location tracking and user education on app use.
mPower – Empowering Women	Bangladesh	Mobile app providing tools for personal safety and access to essential services.	SOS button, location tracking, and access to support services, promoted through local NGOs.	Enabled women to seek help and access services, increasing safety and empowerment.	Ensuring usability for low digital literacy users and maintaining data privacy.
Amber Alert System – Protecting Missing Children	USA	Emergency alert system for quickly mobilizing public in searches for missing children.	Alerts broadcasted via radio, TV, and mobile devices with details about the child and abductor.	Assisted in recovering hundreds of missing children.	Balancing timely alert issuance with avoiding public alert fatigue and ensuring broad reach.
SafeTrek – Personal Safety App	USA	Mobile app for discreetly alerting authorities if feeling unsafe.	Press and hold button sends an alert to police with user's location if not deactivated.	Enhanced personal safety and quick police intervention.	Ensuring app reliability and educating users on effective use.
Panic Button by SafeApp	Mexico	App providing a panic button for emergency situations, especially for women.	Panic button sends location and alert to emergency contacts and authorities.	Enabled timely intervention in emergencies and increased personal safety.	Ensuring app effectiveness and broad adoption among users.

Circle of 6 – Social Safety App	USA	App designed to provide a safety network of friends for quick help.	Users select six contacts for alerts; app sends messages and location if in danger.	Strengthened social support and safety networks among users.	Encouraging app use and ensuring contact list management.
Red Button Initiative – Domestic Violence	UK	Safety button for individuals at risk of domestic violence.	Wearable button sends a discreet alert to authorities with user's location and emergency details.	Provided rapid response and support for victims of domestic violence.	Ensuring button visibility and training for effective use.
SafetyNet – Real-Time Incident Reporting	Australia	App for reporting and tracking incidents of violence or harassment.	Users report incidents in real-time with location data, which is analyzed for trends and used for safety interventions.	Improved awareness and response to local safety issues.	Ensuring accurate data collection and user engagement.
MyGuardian – Personal Safety Service	Canada	Mobile service providing alerts and safety features for individuals.	Includes emergency button, location tracking, and direct connection to emergency services.	Increased personal safety and rapid response in emergencies.	Ensuring app reliability and addressing user privacy concerns.
Scream Alarm – Safety Wearable	Germany	Wearable device that activates an alarm in distress situations.	Device triggers a loud alarm and sends an emergency alert with location to pre-set contacts.	Enabled quick intervention and increased safety in threatening situations.	Ensuring device effectiveness and user comfort.
iAlert – Emergency Alert System	India	System for sending emergency alerts through mobile phones and local networks.	Integrates with local emergency services to send alerts and updates in crisis situations.	Improved crisis response and public awareness during emergencies.	Ensuring timely updates and broad network integration.
SOS Alert App – Women's Safety	Brazil	App designed to provide safety alerts for women in emergency situations.	SOS button sends alert with location to pre-selected contacts and authorities.	Increased safety for women and timely response in emergencies.	Promoting app adoption and managing user data securely.
Guard Me – Personal Safety App	USA	App offering personal safety features including location sharing and emergency alerts.	Users can share location, set safety timers, and send alerts to contacts if feeling unsafe.	Enhanced personal safety through proactive alerting and support.	Ensuring app effectiveness and user education.
SafeLink – Real-Time Safety Alerts	South Africa	Platform for providing real-time safety alerts and updates.	Uses GPS tracking and alerts to notify users and authorities of safety threats or emergencies.	Improved safety and rapid response to threats.	Ensuring reliable GPS tracking and timely alerts.
SecureMe – Safety Network App	UK	App providing a safety network with features for emergency alerts and location sharing.	Includes SOS button, location sharing, and direct connection to emergency services and contacts.	Increased personal safety and quick emergency response.	Encouraging broad adoption and maintaining app reliability.
RescueMe – Emergency Alert System	USA	Mobile system for emergency alerts and safety features.	Features include SOS button, location tracking, and direct alerts to emergency services.	Enabled timely intervention and enhanced personal safety.	Addressing privacy concerns and ensuring app reliability.
SafeCall – Personal Safety Service	Australia	Service providing a personal safety app with emergency features.	Includes SOS button, location tracking, and direct alerts to emergency contacts.	Improved safety and response times in emergency situations.	Ensuring broad adoption and app effectiveness.
HelpMe – Safety App for Women	South Korea	App designed for women to seek help discreetly in emergency situations.	Features an SOS button, location sharing, and emergency contact alerts.	Provided quick assistance and increased safety for women.	Promoting app use and ensuring effective emergency alerts.

the need for ongoing improvements to enhance the effectiveness of safety apps.

Conclusion

The study highlights the significant potential of smart alerting services to enhance the safety of women and children in today's digital landscape. The evaluation of existing safety apps reveals that features such as real-time location tracking, emergency alerts, and geofencing are effective in addressing critical safety issues. Case studies and technological analyses confirm that these services can offer valuable protection and prompt responses in emergencies. To maximize the impact, it is essential to address these challenges and continue advancing technology. Ongoing improvements and innovations in safety apps will be vital in providing reliable and comprehensive protection for women and children, thereby fostering a safer environment both online and offline.

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