WSafe – A Women Safety Android Application

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Abstract. "W Safe – A Women Safety Application" is a groundbreaking mobile application developed with the primary objective of ensuring the safety and well-being of women in today's society. This innovative digital platform is designed to provide women with accessible and effective tools to bolster their personal security and empower them to navigate the world with confidence. Existing safety measures and resources are often fragmented and lack integration, making it challenging for women to access timely assistance in emergencies. Additionally, the lack of awareness about women's safety laws and self-defense techniques further exacerbates the problem. Therefore, there is a critical need for a comprehensive women safety application that leverages the power of technology to provide women with a reliable and user-friendly tool for immediate help, information, and empowerment. By harnessing technology, knowledge, community, and advocacy, this application strives to create environments where women can live free from fear and violence, ultimately working towards a world in which every woman can lead a life of security and empowerment. This work aims to develop such an application, to address the multifaceted challenges faced by women in terms of safety and security.

Keywords: Emergency Assistance · Women's Safety Laws · Comprehensive App · Security and Empowerment

1 Introduction

In an era defined by technological advancement, it is imperative that we leverage the power of innovation to address the pressing concerns of society. Among these concerns, ensuring the safety and well-being of women stands as a paramount challenge [2]. To meet this challenge, the groundbreaking mobile application "W Safe – A Women Safety Application" has emerged, with the primary objective of equipping women with accessible and effective tools to bolster their personal security and navigate the world with confidence. Women's safety has long been a global concern, with existing safety

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measures and resources often fragmented and lacking integration. This fragmentation hinders the ability of women to access timely assistance in emergencies and exacerbates the prevailing issues surrounding women's safety [1, 4].

By harnessing the power of technology, knowledge, community, and advocacy, "W Safe" aims to create environments where women can live free from fear and violence, ultimately working towards a world in which every woman can lead a life of security and empowerment. The core of this project revolves around the development of an application that employs Android Studio, Java, and XML as its building blocks. Through these technologies, the application seeks to provide immediate help, information, and empowerment to women in need, furthering the cause of their safety and security [5, 7]. This research paper will delve into the intricate details of the "W Safe" application, exploring its features, functionalities, and the broader implications it holds for women's safety in contemporary society.

By examining the development and impact of "W Safe," this research paper aims to shed light on the potential of technology to reshape the landscape of women's safety and empowerment [1]. As we delve into the intricacies of this comprehensive women safety application, we will uncover the multifaceted approach it employs, and the possibilities it opens for women to not only protect themselves but also to thrive in a world free from fear and violence. This research paper also seeks to address the broader societal implications of a comprehensive women safety application like "W Safe." In an age where the integration of technology into our daily lives is inevitable, it is crucial to understand how such innovations can reshape the dynamics of gender equality and security [6]. By bridging the gap between women and the timely assistance they require, by imparting knowledge about safety laws and self-defense techniques, and by fostering a supportive community and advocacy, "W Safe" represents a model that could pave the way for a more secure, inclusive, and empowered future for women. The findings and insights derived from this research endeavor promise not only to shed light on the promising potential of "W Safe" but also to contribute to the larger discourse on leveraging technology for the betterment of society.

2 Literature Survey

This paper explores the pressing need for women safety applications, focusing on "W Safe – A Women Safety Application" as a groundbreaking initiative. The paper examines the current challenges women face in terms of safety and security, discusses the potential benefits of technology-driven solutions, and presents a comprehensive review of existing literature in this domain. The safety and well-being of women in today's society are paramount concerns [1]. Addressing these concerns, "W Safe" is introduced as an innovative mobile application that aims to empower women and enhance their personal security. Existing safety measures and resources are often fragmented, making timely assistance difficult to access, while a lack of awareness about women's safety laws and self-defense techniques exacerbates the problem [3, 5]. This literature survey seeks to explore the landscape of women safety applications, their potential impact, and the existing research in this field.

To understand the need for women safety applications, it is crucial to identify the challenges women face daily. These challenges include physical safety concerns, lack

of awareness about their rights, and limited access to timely assistance during emergencies [2, 5]. Existing literature documents these challenges, emphasizing the urgency of addressing them through technological solutions. Technology has become a powerful tool for addressing safety concerns. Mobile applications can provide women with accessible and effective tools to bolster their personal security [7]. This section reviews the role of technology in empowering women, citing relevant research that highlights its effectiveness in enhancing personal safety and building confidence.

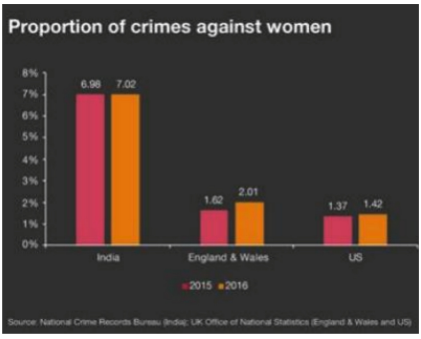

Fig. 1. Statistics of international crime records.

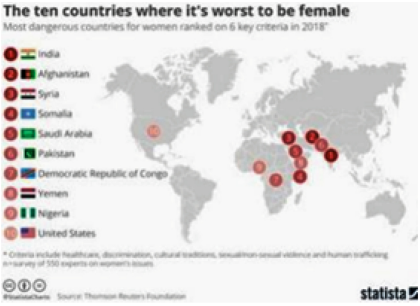

Fig. 2. Survey of countries on women crime

According to alarming statistics depicted in Fig. 1, a woman is subjected to rape in India approximately every 16 min, while incidents of cruelty by in-laws occur every four minutes.

In 2016, the country documented an average of 88 cases of rape daily. Out of the total 32,033 reported rape cases that year, 8% were reported within the Dalit community.

In Fig. 2, the highest number of cases categorized under crimes against women in the Indian Penal Code were reported as 'Cruelty by Husband or His Relatives' (30.9%), followed by 'Assault on Women with Intent to Outrage her Modesty' (21.8%), 'Kidnapping & Abduction of Women' (17.9%), and 'Rape' (7.9%). According to data from the NCRB, the crime rate per lakh women population was 62.4 in 2019, a rise from 58.8 in 2018.

Global status of women safety:

As per UN Women, one in three women globally encounters some form of sexual assault at least once in their lifetime. Research by Sathyasri et al. (2019) reveals alarming statistics: a woman gets kidnapped every 44 min, raped every 47 min, and there are 17 dowry-related deaths daily. The threat of harassment against women isn't confined to external environments; it persists within homes as well. Given the physical disadvantage women may face compared to men, assistance during times of need would significantly benefit them. Various existing systems aim to bolster women's safety [4, 6]. The primary challenge in police investigations regarding female abuse lies in constraints that hinder prompt responses to distress signals. These constraints encompass an inability to pinpoint the exact crime location and failure to recognize ongoing violence. Consequently, it often falls upon the victim to approach law enforcement with certainty and discretion (B.R et al., 2020).

The literature survey concludes by underlining the critical need for women safety applications in today's society. It emphasizes the potential of technology to provide immediate help, information, and empowerment for women, referencing the case of "W Safe" as a pioneering initiative in this regard. The survey acknowledges the gaps in existing research and calls for further exploration in this field to create environments where women can live free from fear and violence.

3 Existing Methods

Recently developed women's safety solutions come in various types such as smartphone apps, security systems and fashionable devices which can be worn everyday. One of the solutions suggests sending a notification to the police or selected contacts when the victim presses the power button. The system then sends the victim's live location after 1 min. Hence provides a better location when the user or victim moves from one location to another. Some systems offer a woman authenticated to the device to perform a fingerprint scan. After that, the woman should always scan her fingerprint every minute. Otherwise, the system will send the woman's location to the registered number via SMS. In the event of a serious situation, the woman does not need to do anything other than simply stop scanning her fingerprints.

4 Proposed Methods

In order to achieve the primary objective of creating a comprehensive women safety application, "W Safe," several key methods and tools must be implemented. This section outlines the.

proposed methods for the research paper that will delve into the development of this innovative application.

1. Android Studio as the Development Environment:
   - Detailed examination of Android Studio as the primary development environment for creating "W Safe" application [1, 3, 7].
   - Insights into how Android Studio streamlines the development process, making it a suitable choice for creating a user-friendly women safety application [8].
2. Java and XML for Coding and UI Design:
   - In-depth analysis of the role of Java in the coding process, including its significance in ensuring the application's functionality and responsiveness.
   - Exploration of the use of XML for UI design and its impact on creating an intuitive and visually appealing interface [3].
   - Discussion of the proficiency required in both Java and XML for the successful development of "W Safe," with a focus on the unique challenges and opportunities they present.
3. Database System Integration, Potentially SQLite:
   - Evaluation of the database system's importance in the application's data management, storage, and retrieval [7].
   - Consideration of SQLite as a suitable database management system, detailing its strengths and limitations [5, 6].

4. Web Services and APIs for Real-Time Information:
   - Examination of the integration of web services and APIs into "W Safe" to provide real-time information and connectivity [1].
   - Discussion of the selection criteria for relevant web services and APIs, including their role in enhancing the user experience and safety features.
   - An analysis of the benefits of real-time information, such as safety alerts, location-based services, and communication capabilities through web services and APIs.
5. User Testing and Feedback:
   - An analysis of the benefits of real-time information, such as safety alerts, location-based services, and communication capabilities through web services and APIs.
   - Collection of user feedback to refine and enhance the application's features, ensuring it meets the specific needs and expectations of its target audience [5–7].
6. Data Collection and Analysis:
   - Comprehensive data collection methods to gather information on the application's usage and user behavior [7].
   - Detailed data analysis to measure the application's impact on women's safety, including user adoption, emergency response times, and the effectiveness of safety features [5].

These proposed research methods will provide a comprehensive understanding of the development and impact of "W Safe," highlighting the importance of technology and innovation in addressing the critical issue of women's safety. The research paper will offer valuable insights into the tools, techniques, and strategies used to create a user-friendly and effective women safety application in the modern world.

5 Outcomes

Outcome 1: "Reduced Incidents of Harassment and Violence: An Analysis of the Impact of Safety Applications on Women's Safety."

Outcome 2: "Emergency Assistance and Its Efficacy in Ensuring Women's Safety: A Case Study of W Safe."

Outcome 3: "Community Support and Solidarity Among Women Through Safety Applications: A Sociological Analysis."

Outcome 4: "Personalized Safety Plans for Women: An Evaluation of Customized Safety Measures within W Safe."

Outcome 5: "Advocacy and Awareness Campaigns via Safety Applications: Promoting Legislative Changes and Societal Shifts for Women's Safety."

6 Architectural Diagram

Figure 3 demonstrates the flow of processes in the proposed application. On installing the application, it primarily asks the required permissions that are required for the application mainly GPS of the android device. Then it navigates to home menu where it contains four buttons stating Contacts, SMS alerts, Self Defense and Laws. On clicking each button, it navigates to its respective layout containing one or more buttons. On pressing "Contacts",

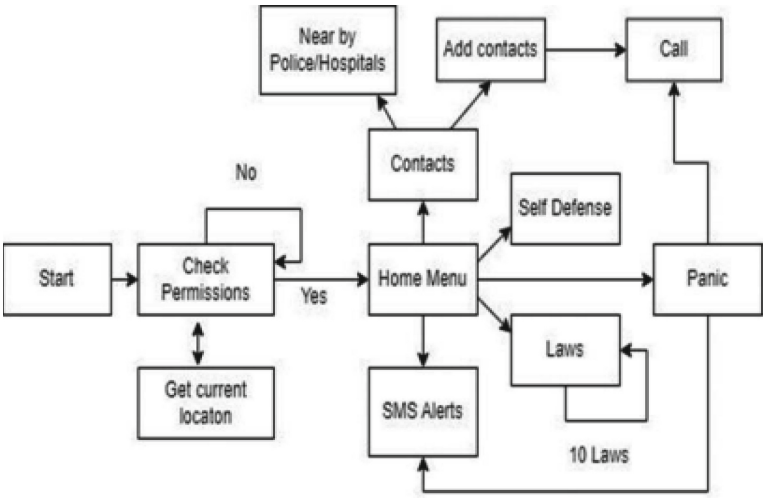

Fig. 3. Architectural diagram

it navigates to a layout which contains two buttons stating "Near-by hospitals" and "Near-by police stations" which access GPS of the android device. And it also contains phone number field where we can store emergency personal numbers which can be accessed during emergency or by clicking panic button. On pressing "Self Defense" and "Laws", it navigates defense video tutorials from YouTube and rights that are applicable to women across the nation respectively.

7 Implementation

Module 7.1 – GPS Module:
This module offers two functionalities: "Panic" and "Track," providing security options for the user. The "Panic" Button aims to safeguard users feeling unsafe in their surroundings [3, 6].

Upon selection, this option alerts nearby hospitals through the GPS System. Utilizing GPS tracking for longitude and latitude, it extracts the user's current location. Simultaneously, it dispatches a pre-saved emergency message via GSM to both nearby hospitals and registered mobile contacts.

Module 7.2 – User Interface and Mobile Shaking:
The design of the user interface aims to offer a user-friendly experience. Within this module, users are required to input details such as the mobile numbers of their friends for the first time. Additionally, in the app's settings, users need to specify threshold values.

Module 7.3 – Location Identification:
The Global Positioning System (GPS) is a satellite-based navigation system offering location and time information globally, regardless of weather conditions, provided there's an unobstructed line of sight to four or more GPS satellites..

Module 7.4 – Nearby Police Stations and Hospitals:
This functionality allows users to access information about nearby police stations and hospitals within a 5km radius of their current location [5].

Module 7.5 – Emergency Calling:
This feature allows users to initiate a call to a hospital in case of an emergency [11]. It comprises two types of emergency calling systems: Default and User-Enabled Default Calling.

During User-Enabled Calling, the call is redirected to a default number pre-set during implementation. This feature specifically pertains to hospitals [4, 7].

8 Results

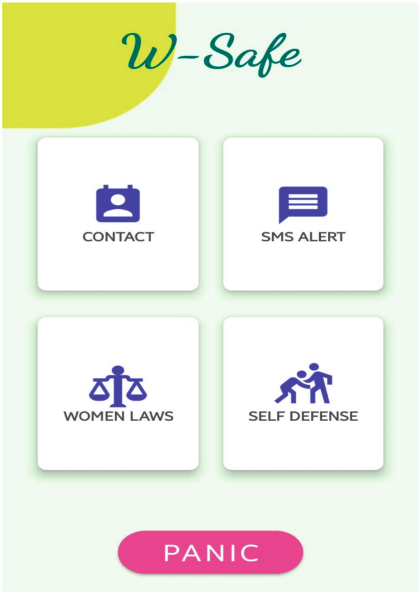

Fig. 4. Home layout of the application

Fig. 5. Emergency layout of the appliaction

The above Figs. 4 and 5 demonstartes the propsed appliaction. It comes with 5 buttons on the home layout. Contact Button is used to store the emergency contacts and to known nearby hospitals and police stations. SMS alert button is used to send alert messages to the registered contacts and contacts of different helplines available in India. Women laws button is used to known different laws that are available to women with brief description. And finally self defence button loads some defensive technique videos for women to learn in free time.

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