IoT based Safety device for Human

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Abstract*: The proposed IoT-based safety device aims to address the ongoing concern for human safety, particularly in remote or deserted areas. Unlike existing handheld safety devices, this solution eliminates the need for manual intervention by leveraging IoT and Android technology. Through voice commands, the device can automatically alert nearby individuals and law enforcement in unsafe situations. Equipped with a shockwave generator in the shoes for immediate self-defence, the device utilizes GPS, Wi-Fi, and Bluetooth to track the user's location and communicate with nearby devices for swift assistance. Additional features include group messaging, attacker photography, and displaying safe locations through a user-friendly mobile app. Designed to be lightweight and user-customizable, this solution offers comprehensive safety for individuals of all ages and abilities.*

Keywords: IoT, Shockwave generator, mobile app, voice commands

I. INTRODUCTION

The issue of human safety, especially in countries like India with escalating crime rates, remains a significant concern despite technological advancements. This paper proposes an IoT-based solution to address the vulnerabilities faced by individuals, particularly when traveling alone or in remote areas. The design includes features such as alerting family members and nearby authorities, a shockwave generator for self-defence, group messaging capabilities, victim photo capture for evidence, and locating safe places on a map. By addressing the shortcomings of existing devices, this solution aims to provide immediate assistance to individuals in danger, emphasizing the importance of prioritizing human safety globally.

II. RELATED WORK

In the area of designing safety devices for women's, several works have been proposed, like:

Smart women Safety Device using IOT:
The project aims to address the lack of robust mechanisms to prevent the criminalization of women by providing a user-friendly device that allows them to immediately identify themselves to authorities in times of danger, providing security advantages for emergency situations.

A Raspberry Pi Based Smart Wrist Band for Women Safety Using IOT:
The proposed device, using Raspberry Pi zero W, aims to provide women/children with safety and security by sending GPS location and images to police and emergency contacts upon manually triggered emergency button press, to prevent sexual assaults and increasing crimes against women.

An Android App for Human Safety:
The "Suraksha" android application allows users to quickly react to emergencies by signing up, adding emergency contacts and messages, and using a gesture (drawing an "S" shape on the home screen) to trigger sending an offline message with GPS location to the emergency contacts.
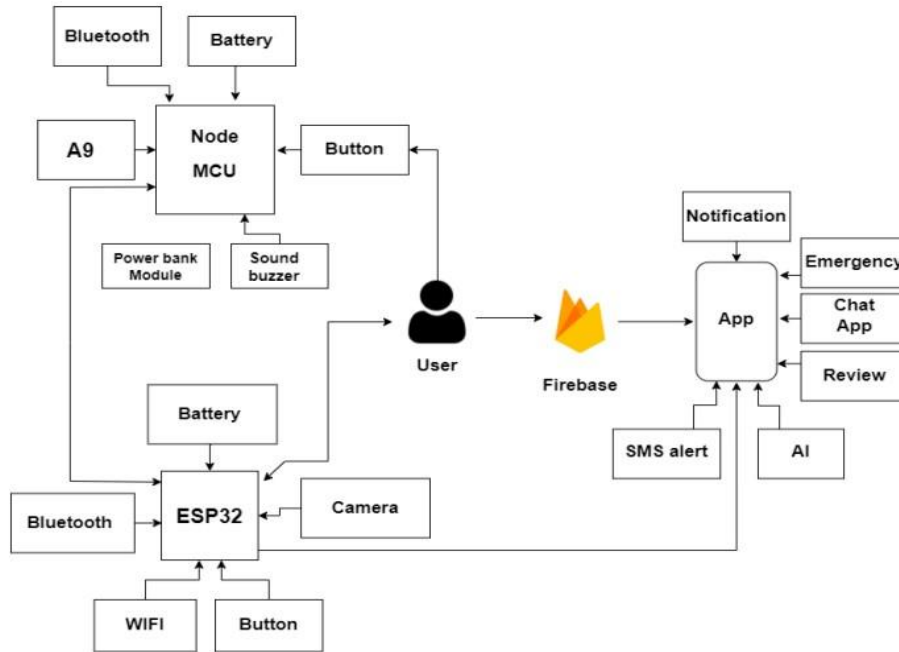
Fig. 1: System Architecture

III. PROPOSED WORK

The proposed IoT-based safety device aims to enhance human security by integrating sensors for detecting unsafe situations and automatic alert systems for notifying pre-defined contacts and authorities. Voice-activated commands ensure easy activation of safety features, while a built-in self-defence mechanism provides immediate protection. Leveraging IoT connectivity, the device facilitates rapid communication and data transmission, aiding in swift response during emergencies. Additionally, it includes features for capturing evidence and integrating with a mobile application for real-time tracking and community alerts. Designed for user comfort and discretion, this device seeks to empower individuals with proactive safety measures in various environments
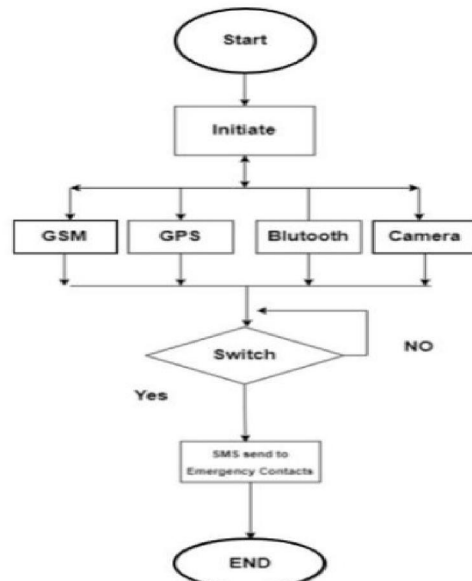

Fig.2: Data Flow Diagram

IV. METHODOLOGY

The proposed IoT-based safety device begins by connecting the GPS to satellites to obtain longitude and altitude data, which is then processed by a GPS tracker and sent to an Arduino Nano microcontroller. The SIM800L GSM module connects to the Blynk cloud for network registration. Users can trigger calls and SMS alerts to predefined contacts with a button press, indicated by LED status. The accompanying application offers a secure interface for user interaction, enabling device control and data analysis through APIs and cloud storage. Integration of GPS and GSM modules enables location tracking and communication with emergency services for enhanced safety.

EV. CONCLUSION

The proposed human safety device integrates hardware and software solutions to enhance security. By combining IoT devices with a mobile app, unique user identification is ensured, while features like a buzzer alert nearby individuals and text messages notify relatives and police of the victim's location. Additionally, a shockwave generator in shoes offers temporary self-defense, and an Android app with group messaging and safe location identification further enhances safety options. Overall, this integrated approach has the potential to greatly improve human safety and provide comprehensive security solutions

VI. RESULT

This section presents the results of the experiments conducted with the proposed hardware design and android application. The procedure and working of all IOT devices are shown below
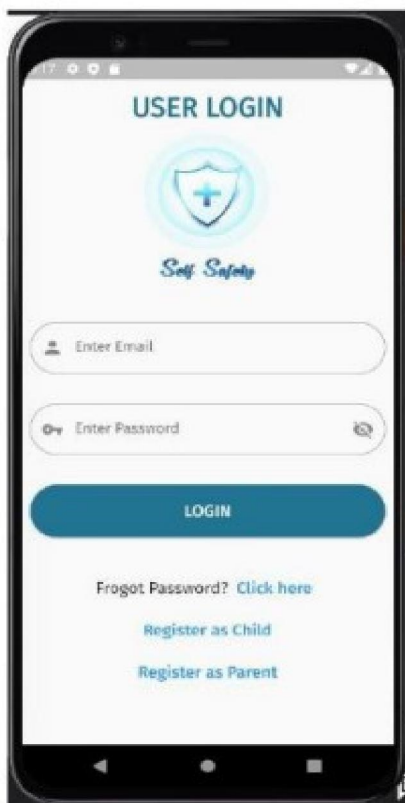

Fig.3: User login page for child and Parents registration.

Fig.4: Registration page interface for parents

Fig.5: Registration page interface for child Registration.

Fig.6: App UI interface for user.

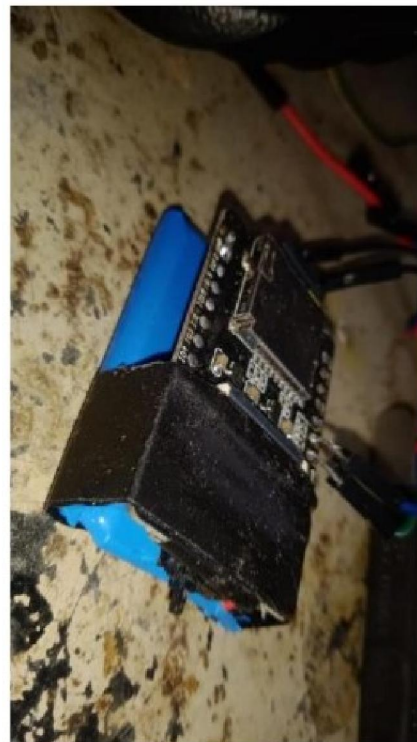**Fig.7: Shoe (Node MCU, Shockwave Generator, Buzzer, Battery).**

Fig.8: Pendent (ESP32, Battery).

VII. ACKNOWLEDGMENT

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