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IOT BASED SMART WOMEN SECURITY SYSTEMS

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ABSTRACT

The growing amount of harassment, assault, and emergency situations reported globally has made women's safety and security a key concern in modern society. In emergency scenarios, traditional safety measures like helpline numbers, mobile applications, and manual reporting methods frequently fall short of offering prompt aid, particularly when the victim is unable to access a smartphone or make a phone call. In order to overcome these obstacles, this project offers an IoT-based smart women's security system that offers location tracking, emergency alerting, and real-time monitoring to guarantee prompt action in emergency scenarios. In order to identify emergency situations and promptly alert designated contacts and authorities, the suggested system combines wearable or portable gear with sensors, an embedded controller, and Internet of Things connectivity. Whether turned on manually or automatically, The solution uses cloud-based IoT services to deliver alert messages to registered recipients together with the victim's current position. This system offers a dependable, economical method of women's security while reducing reaction times and improving individual safety. The suggested solution uses clever technology to support smart city projects and help create a safer society.

Keywords: Aurdino UNO Micro controller, Power Supply, Wi-Fi Module ,LCD(16*2), SOS Button, MEMS, GPS, Buzzer, Cloud Webserver\App

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I INTRODUCTION

Due to an increase in harassment, assault, and emergency situations, women's safety has become a major global social concern in recent years. Many women still experience unease when traveling, working late, or living alone despite technological developments. During real-time emergencies, traditional safety measures like emergency helpline numbers, mobile safety apps, and manual reporting systems frequently fall short. In many cases, fear, panic, or physical confinement may prevent victims from using their phones or making distress calls. This restriction emphasizes the necessity of an automated, quick, and dependable safety system that can function without human interaction. The Internet of Things (IoT) quick development provides a viable platform for tackling Intelligent safety systems can be created to offer prompt aid in emergency circumstances by combining sensors, embedded technologies, and wireless communication. By providing constant monitoring and prompt emergency response, the IoT-based Smart Women Security System aims to improve individual safety. To identify emergency situations, the suggested system makes use of wearable or portable gear that is integrated with sensors and an intelligent controller. The system initiates an alarm mechanism upon activation, which can be done manually via an SOS button or automatically by sensor inputs. This alarm, coupled with the victim's current position, is sent via IoT connectivity to designated contacts and relevant authorities. GPS technology is essential for tracking the user's precise location and facilitating prompt rescue efforts. IoT services that are cloud-based provide dependable data transfer and accessibility from any location. The efficiency of the system is further strengthened by the addition of alarm mechanisms like buzzers and display units. The suggested approach greatly shortens emergency response times and increases the likelihood of prompt

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intervention. Additionally, the system is made to be affordable, portable, and easy to operate, which makes it appropriate for broad application. This project highlights how intelligent technology may be used to create a society that is safer and more secure for women, and it is in line with smart city ambitions.

II LITERATURESURVEY

[1] The application of GPS-enabled wearable technology for women's safety was examined by Bhattacharjee et al. (2019), who emphasized the significance of real-time location tracking and instant messaging to designated contacts in an emergency. Their study showed that, in comparison to traditional approaches, IoT combined with GPS offers improved situational awareness and enables quicker reaction times. In a similar vein,[2] Gupta and Singh (2020) created a smart emergency warning system that used GSM modules in conjunction with accelerometer and gyroscope sensors to detect abnormal movements or falls, automatically sending caregivers SMS alerts. An Android-based safety app connected to cloud services was proposed by [3] Sharma and Patel (2021), allowing for continuous monitoring and single-touch panic signal activation. According to their research, integrating cloud IoT platforms like Firebase improves message delivery's scalability and dependability. Multi-sensor arrays have been integrated into more sophisticated systems to identify contextual signs of distress. For instance, a research by [4] Reddy and Kumar (2022) described an Internet of Things system that uses motion, sound, and heart rate sensors to detect anomalous patterns and send out notifications on its own. They discovered that integrating environmental and physiological data improves emergency detection accuracy and lowers false alarms. Numerous intelligent wearables have also been investigated. [5] Alam (2021) created a smart wristband with GPS, GSM, and a panic button. The wristband ensured mobility and continuous preparedness while offering an easy-to-use safety solution. However, the research recognized that there are still technical issues with power usage and sensor calibration.

III EXISTING SYSTEM

The majority of the current women's security systems rely on traditional safety measures including emergency helpline numbers, mobile applications, and manual reporting techniques. The majority of these solutions require the user to actively start an emergency alert by pushing a smartphone button or making a phone call. In emergency scenarios, fear, physical confinement, or unconsciousness may prevent people from using their phones. The dependability of a number of current safety apps is limited by their complete reliance on smartphone battery life and mobile network availability. Emergency response times are delayed because many systems only function after being manually activated. There are several wearable safety gadgets on the market, but they are frequently pricey and lack sophisticated automation. Current systems often have poor sensor integration, which makes it challenging to automatically identify emergency situations.

The efficacy of these methods is diminished by the lack of autonomous danger detection. User adoption is further constrained by large device designs and battery usage. Furthermore, a lot of solutions don't offer continuous and precise position tracking. Coordination between emergency contacts and authorities is hampered by the absence of centralized monitoring. In general, current women's security systems offer only partial answers; they are unable to guarantee prompt, dependable, and intelligent protection in the event of an emergency.

IV PROPOSED SYSTEM

The proposed IoT Based Smart Women Security System is designed to provide an

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intelligent, reliable, and real-time safety solution for women during emergency situations. Unlike existing systems, the proposed model integrates wearable or portable hardware with multiple sensors and IoT connectivity to ensure continuous monitoring. An embedded controller acts as the central unit, coordinating all system operations efficiently. The system allows both manual and automatic activation of emergency alerts through an SOS button and sensor-based detection. When an emergency is detected, the controller immediately triggers alert mechanisms without requiring smartphone interaction. The GPS module continuously tracks the user's live location with high accuracy. Using Wi-Fi or IoT connectivity, alert messages along with location data are transmitted to cloud servers. Cloud-based services provide immediate notifications to designated contacts and relevant authorities. To draw attention from anyone in the vicinity and discourage potential assailants, a buzzer is turned on locally. Real-time system status and alarm confirmation are shown on the LCD display. The MEMS sensor assists in identifying unusual force or movement, which may be a sign of distress. By allowing automatic notifications, the system reduces reaction time. Remote accessibility and safe data storage are guaranteed by cloud integration. The suggested method is affordable, portable, and simple to use. It facilitates integration with smart city infrastructure and scalability. Overall, by integrating automatic emergency response, real-time communication, and intelligent sensing, the suggested solution improves women's safety.

Block Diagram

Fig .1 Block diagram

V HARDWARE DESCRIPTION

ARDUINOUNO

In order to create digital devices and interactive objects that can sense and control both physically and digitally, Arduino is an open-source hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits. Anyone can build Arduino boards and distribute its software thanks to its products' GNU Lesser General Public License (LGPL) or GNU General Public License (GPL) licenses. Commercial preassembled Arduino boards and do-it-yourself (DIY) kits are both available.

Fig.2 ARDUINO UNO BOARD

SOSBUTTON

The SOS button is a user-provided manual emergency trigger. When pushed, it instantly activates the alert mechanism. The controller then transmits position information and emergency alerts. This enables prompt action in urgent circumstances.

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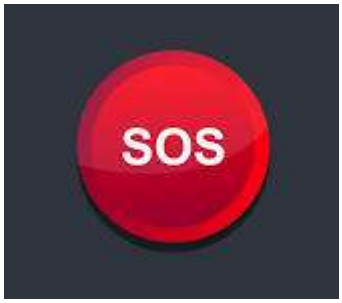

Fig.3 SOS BUTTON

MEMSSensor

The MEMS sensor detects motion, tilt, or abrupt movements of the user. It aids in recognizing unusual behaviors like falls or strong motions. It can automatically send out notifications when it detects odd motion. This gives an extra degree of safety.

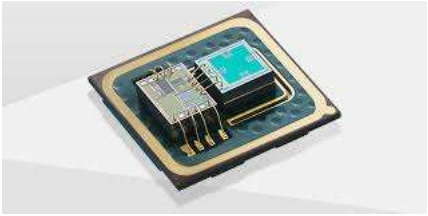

Fig.4 MEMS Sensor

LCD Display

The current number of visitors is displayed in real time on the LCD panel. It makes it possible to track occupancy locally within the building. The current technology does not allow data logging or remote viewing of the display.

Fig.5 LCD Display

Wi-Fi module

The system may connect to the internet thanks to the Wi-Fi module. It uses IoT platforms to deliver location information and alarm messages to pre-selected contacts. This permits real-time connectivity with cloud services. It enables speedy and reliable emergency alerts.

Fig.6 Wi-Fi module

GPS

The user's current position is ascertained via the GPS module. It gives the controller latitude and longitude data. This location data is delivered along with alert messages. Responders can get to the victim more quickly with accurate tracking.

Fig.7 GPS

Buzzer

In the system, the buzzer serves as an alarm and warning mechanism. When any health parameter surpasses safe limits, the controller initiates it. In an emergency, this offers instantaneous local notification. The buzzer

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facilitates prompt attention and response from caregivers in the vicinity. It improves system dependability and patient safety.

Fig.8

Buzzer

VI RESULTS

When compared to conventional safety mechanisms, the findings of IoT-based women's security systems show a notable improvement in personal safety. The majority of IoT safety devices effectively deliver real-time emergency alerts during crisis circumstances, according to research implementations. GPS-enabled devices have demonstrated efficacy in monitoring the user's current location with a respectable degree of precision. Shortly after activation, alert messages with location data are sent to authorities and pre-designated contacts. Manual SOS buttons that function dependably in an emergency are supported by many systems. Sensor-based systems have demonstrated the capacity to identify anomalous motions, including panic attacks, aggressive activities, and abrupt falls. By enabling solo operation, current systems have decreased reliance on cellphones. Continuous monitoring and remote access to alarm data have been made possible by cloud-based technologies. Buzzer and alarm mechanisms have helped in attracting nearby attention and deterring attackers. However, the data also show that sensor limitations might cause misleading warnings. Battery life has been identified as a major constraint in continuous GPS tracking systems. Network dependency affects alert delivery speed in areas with poor connectivity. Some systems face delays in cloud message synchronization. Data security and privacy challenges have been observed in shared cloud environments. Despite these limitations, existing systems provide consistent emergency notifications. Many implementations successfully store alert history for future analysis. Real-time dashboards have improved situational awareness for guardians. Integration with mobile applications has enhanced user interaction. Field testing shows improved confidence among users. Response time during emergencies has been noticeably reduced. Overall, existing results validate the effectiveness of IoT technology in women safety applications. These outcomes form a strong foundation for developing more accurate, reliable, and scalable women security systems in the future.

VII CONCLUSION

The project's IoT-Based Smart Women Security System offers a practical technology response to the escalating worries about women's safety in contemporary society. By providing automated and real-time emergency support, the system effectively overcomes the drawbacks of conventional safety measures like helpline numbers and mobile-based applications. By integrating wearable or portable hardware with sensors, an embedded controller, and IoT connectivity, the proposed system ensures continuous monitoring and immediate response during distress situations. The system's dependability under dire circumstances is improved by the capacity to manually and automatically activate alarms. Real-time location tracking using GPS enables accurate identification of the victim’s position, allowing quicker rescue operations. Cloud-based IoT services are essential for guaranteeing immediate connection with designated contacts and relevant authorities. Response time is a critical component in emergency circumstances, and the technology dramatically shortens it. Personal safety is further reinforced by alert systems like buzzers and notification services. The suggested

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solution is intended to be widely adopted since it is affordable, portable, and easy to use. The technology gives women more self-assurance and security in their day-to-day activities. All things considered, the project shows how IoT technology can be successfully applied to create an intelligent women's security system. The effective deployment of this system demonstrates the potential of smart technology to enhance societal well-being and helps to create a safer environment.

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