DESIGN OF A SMART SAFETY DEVICE FOR WOMEN USING IOT

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Abstract:
In this generation we give equal rights to men and women. They are self-sufficient and can now work anywhere. Although we are evolved now, women's safety has long been a concern. Nowhere is safe for women or girls. There are various tools to stop exploitation such as paper spray, alarm, shockwave generator. However they are insufficient to protect women and girls. Our goal is to adequately provide safety for ladies. The systems serves some add-ons that will notify those nearly of her location and send message to her registered contact number the folk nearly will also be notified and aware that someone is in danger as a result of the alarm sounding, so that she can quickly receive help from other and her family. In order to provide Indian women a sense of security and empowerment we are concentrating on developing an efficient, quick, and reliable method to inform the police and anybody around of any trouble or send an alert message. By using information technology, protect women from crime and sexual assault.

Keywords:
GPS module, GSM module, Node MCU

I. Introduction

If our culture does not care about the safety of women, then we are living in troubled time. More than 80% of women faced miss behaviour but only few of them reported. Women harassment includes rape sexual abuse, kidnaping and all others. Now days some devices are available for women safety but they are not good enough for them. There are even laws to safeguard women, but they are only helpful once misbehave has occurred. They still don't have a way to feel secure prior to misbehave. The goal of technology is to protect women from harm and overcome all obstacles. The technology on this device assures dual alerts in the event that a woman is harassed or believes she is in risk. This gadget is incredibly simple to use and can be handled by anyone. Women can freely move anywhere without depending on anyone. Women will simply press the push button if she feels unsafe. The main gadget located in bag and handbag. The primary device location is where registered number are sending alert messages. According to a report by Thomson Reuters Foundation, India is ranked as a highly dangerous place for women worldwide; India has the greatest number of child brides as well. In 2016, the number of reported rapes is almost 39,000. Experts that were interviewed for the reason why India is presumed to be dangerous for women said India is on top of the list because its government has done almost nothing to provide safety to women since the rape and murder of a student in early 20's in 2012 which prompted changes in the rape laws of the country. Most of the attacks on women happen when they are traveling alone or are in a remote area where they are not able to find any help or proper assistance. This paper proposes an IoT based solution to address the problem of women safety and that overcome the shortcomings of existing devices. The proposed design comprises of features to notify family members and nearby police station for immediate assistance when women are not safe.

1.1 Problem Statement

The level of sexual harassment in our nation is alarming. The rape of minors in gangs, on school girls on working Women are highly odd occurrences. There are several charities, apps, helplines yet even they cannot guarantee women security. Due to social stigma women are afraid to complain. There are some apps that can alert saved contacts but none of them work well. So significant modifications should be required to stop all of these crimes.

II. Literature Review

These days, women's safety is a vital concern, so this technology is very beneficial for women's safety. We have started implementing our design for "Design of a smart safety device for women using IoT" by reviewing various documentation and methodologies. The following papers were reviewed for literature

In this project if women manipulate the handheld device by pressing buttons or otherwise. However, if it fails when she is unable to respond. If a woman is attacked from behind using this fingerprint-based method, it will also notify the police and other individuals in the area. If there isn't fingerprint verification, the system will instantly notify the police and anyone in the area. Android application features include the ability to record the victim's audio and advice nearby others. [1, 9, 10]

IoT based system was developed for women's safety with an alarm to utilise in an emergency for both women and children. GPS and GSM modules are also used when the GPS is activated, the victim's location is pinpointed, and the message "Woman insecure" is transmitted from the microcontroller to the victim's approved group via the GSM module.
[2, 7, 8]

This paper suggests that the different safety precautions offered to women and this task fall under the category of maintaining security. It is suggested to use an Arduino-based new perspective on women's security warning systems that can transmit SMS alerts to the victims' families, allowing women to proceed with their daily activities unafraid. Arduino has a built-in alert system that recognises and notifies the authorised individual of any unauthorised instruments. [3]

This paper summarises that no security measure can guarantee complete protection. Multiple gadgets must be carried by the user. They discovered a protection tool with all the features accessible with a single click. The ARM controller and Android application used in this study are synchronised via Bluetooth, allowing the device and smartphone to be operated separately. This project can record audio for further inquiry; call and message registered contact numbers with the location every two minutes, and allow for live tracking using the application. It can also record audio for further investigation. This project also includes a hidden camera detector to guarantee privacy. [4]

This system serves there are four primary goals, the first of which is to use GPS and GSM to transmit the location to the saved contact numbers. Second, she can activate the buzzer so that people in the area can assist her in escaping the predicament. The primary function of this device will be to transmit the women's pulse rate to the Thing Speak cloud via Wi-Fi and store it there while also sending the same data to contacts that have been saved. The fourth is that by choosing not to kill the abuser but giving the victims an opportunity to flee the area, she can shock the abuser.[5]

This device's primary function is to function as an emergency device that will hit the panic button if it senses danger to notify the pre-provided mobile numbers, an SMS comprising the latitude and longitude coordinates will be sent. The women's position can be found by looking at the received coordinates on a Google map. [6]

2.1 Methodology
2.1.1 Hardware Components

Power supply: An electrical appliance known as a power supply provides electricity to an electrical load, such as a server or laptop computer, among other electronic devices. Converting electric current from a source to the proper voltage, current, and frequency to power the load is the primary purpose of a power supply.

GPS Module: A satellite provides a specific location to the GPS module. When you're outside, GPS is a useful tool for locating a location. The GPS module can make use of a number of GPS satellites. In this section, we'll try to use a GPS module to access a location.

GSM Module: A SIM card is used by the GSM module as an access point. It starts a stable connection with any website using related protocols. It is used to create a mobile and portable Internet of Things device that can transmit data to a specified web server and be accessed from any location in the world.

ESP8266 Wi-Fi: A self-contained SOC with an integrated TCP/IP protocol stack, the ESP8266 Wi-Fi Module allows any microcontroller to access your Wi-Fi network. The ESP8266 is capable of offloading all Wi-Fi networking tasks from another application processor or hosting an application.

Node MCU: A cheap open source IoT platform is Node MCU. It originally included hardware based on the ESP-12 module and firmware that runs on Espress if Systems' ESP8266 Wi-Fi SOC. Support for the 32-bit ESP32 Microcontroller was later added.

Buzzer: A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, train and confirmation of user input such as a mouse click or keystroke.
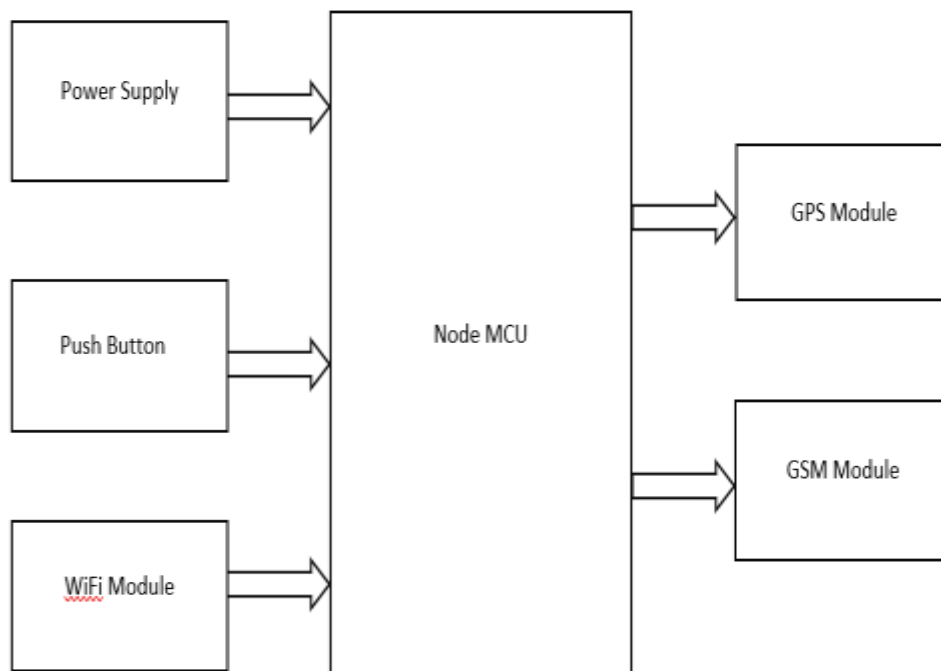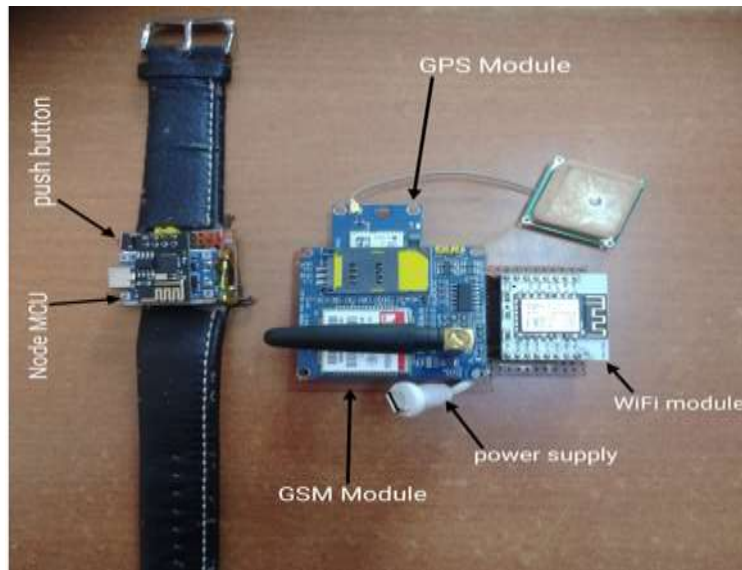
2.2 Block Diagram

**Figure 1: Block diagram of Smart Safety device for women**

2.3 Proposed Hardware Device

Figure 2: Proposed hardware design for Smart Safety device

Whenever someone feels endangered, she pushes the button as soon as the device on the Node MCU receives power from the power source. Hence, we provide the Node MCU with an ESP 8266 Wi-Fi module so it can contact Wi-Fi network. In order for her family and friend to realise that she is in danger and to know where she is, a GSM module will send a message to saved contact number and a GSP module will relay the location to the same number.
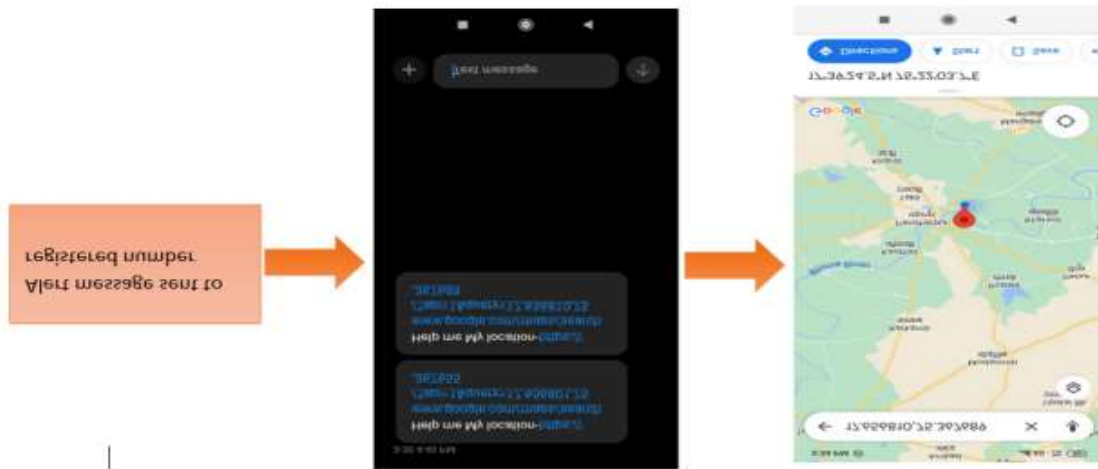
2.4 Work Flow
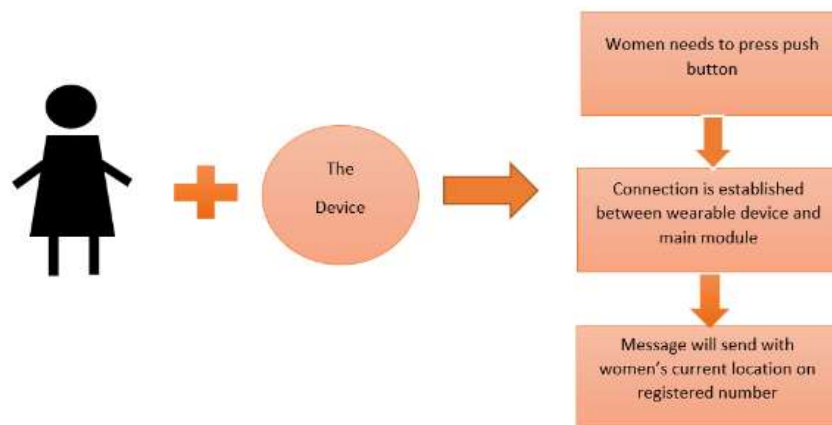
Figure 3: Work flow of the proposed design

2.5 Result

Greater usage of public spaces by women; improved public knowledge and disapproval of exploitation; decrease of issue like sexual harassment of women and girls in the intervention city or neighbourhood.

III. Conclusion

The concept presented here is important for the safety of women. The proposed design will address the key issues that women have faced and will help to find solution through the technology. With more innovation, this idea might be used to several security fields.

References

[1] Wasim Akram, Mohit Jain, C.Sweetlin Hemalatha,"Design of a Smart Device for Women using IoT " International Conference on Recent Trends in Advance Computing 2019,ICRTAC 2019.

[2] S. Pradip, Kanikannan, M Meedunganesh, A. Anny Leema," Implementation of Women Safety System Using IoT" International Journal of Trend in Scientific Research and Development (IJTSRD).

[3] "Implementation of Women Safety System using Internet of Things" S Pradeep, Kanikannan, M Meedunganesh, A. Anny Leema School of Information Technology & Engineering (SITE) Vellore Institute of Technology (VIT), Vellore, Tamil Nadu, India.

[4] " Women Safety Device and Application -Femme" by D.G.Monish, M.Monish,G.Pavitra and R.Subhashini

[5] Hrucha Wankhade, Siddhi Mahajan, Prof.Shokbhika P Gopnarayan "Women Safety Device with GPS Tracking and Alert"

[6] Shrily Edward "GSM Based Women's Safety Device" article in International Journal of Pure and Applied Mathematics. June 2018

[7] "Pradeep Kanavi, Nikhath Anjum M Y, Poornima C, Uzma Khanum N, Vinutha B B "Women Safety Device with GPS"

[8] "Women Safety Device with GPS Tracking And Alerts" Riddhi Shah, Miloni Ganatra.

[9] "Women Safety Device using IOT" Dr. C K Gomathy, Ms.S.Geetha Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya, Kanchipuram.

[10]   "Women's Safety Device" Saurabh Patil, Anto Fernando, Cleetus Rodrigues, Mohit Rao, Shane Parmar