IoT Based Smart Emergency Locket to Ensure Protection for Women

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Abstract:

Violence against women is highly dominant and every year thousands of incidents related to women's harassment are reported around the world. There could be no appropriate system that ensures security for women and in most circumstances, the victim does not find any help around and does not have enough time to call or message someone about the emergency. Hence, through this paper, we propose a new viewpoint to utilize the technology for ensuring protection to women. It is imperative to have some gadget that can be accessed easily and associate women in a tough situation with trustable contacts such as family and friends. We provide an answer to this issue with a wearable smart locket. It is implanted with a basic push button and by pressing that push button, the alert is sent immediately to the prime contacts through message, email, and a call in troublesome situation. This locket is done with an ESP8266 microcontroller, associated with the Wi-Fi network. The proposed locket can likewise be valuable for some individuals with a disability and also for security purposes. The system is bound together with the Internet of things and helps to provide safety to women effectively.

Keywords – Emergency, IoT, Smart locket, Wi-Fi, Women safety

I. INTRODUCTION

In a current scenario, the prime question in everyone's mind is related to women's safety and harassment issues. Nowadays women's safety has been a big issue and, in many situations, they are feeling unsafe especially when they travel alone on roads or at late nights. In a country like India, the growth of crime rates on girls is more than the growth rate of the population. Many cases are recorded because of the lack of communication at that particular instant of time, while traveling alone.

Even technology can play a major role to control this type of scenarios, by developing gadgets that are useful to women for their safety. This paper proposes an IoT-based solution to help reduce this problem and is also useful for several other situations. This paper mainly focuses on the design of security systems to provide security, so that we can feel secure in any kind of situation and challenge.

If these types of systems are used in real-time the person will think once before they attack and this leads to a decrease of the criminal cases against women. By seeing all the above cases we can conclude that the device which we require should be wearable and it should be available 24*7 because we cannot predict the hurdles. In our daily life generally, we use locket with chains, so an IoT-based locket is one of the best options.

As the size of the locket is very small, we have to choose the microcontroller which suits this purpose and ESP8266 is the best option for this project. The locket consists of an emergency button, whenever a person feels that the situation around is unsafe, immediately they can press the button. After the button press, the locket activates and the action will be done by it accordingly. This project consists of features like:

1. Within seconds buzzer makes a loud sound to make nearby people conscious
2. Text messages will be sent to the predefined contacts (like parents, friends, etc.)
3. Emails will be sent to the trusted predefined email ids.
4. Call with a voice message will be received by the people who installed the application and logged in with those credentials.

All the above messages, email, voice messages information can be easily written, and this smart locket can be connected to a mobile hotspot or any Wi-Fi.

II. RELATED WORKS

Especially numerous mobile applications and accessories have evolved for women's security. Some of them include,

1. VithUapp [1] - Sends emergency warnings to the pre-defined contacts when they press a power button twice, then GPS will update for every button press [2],[3],[4].

2. Life360 family locator app [5]- This application groups family and friends and it also allows the access of locations to each and every member of the group.

3. Emergency watch [6]-by Punith Kumar & Shiva Kumar, this watch will record the voice and it will send to the nearby police stations, and GPS will be noted.

4. SHE (society harnessing equipment) [7]-by Manisha Mohan, Noladri Basubal, Rimpi Tripathi, it will consist of sensor and shock circuit board and it will be placed in inners near bosom because women are attacked there first [4].

5. Smart belt [3]- It will consist of a pressure sensor when pressure crosses the alarm will be activated.

6. Smart shoe [9]- send a live video to contacts by this fear no one will attack

7. Smart band [8]-This band is integrated with a mobile app and it will send SMS and GPS to prime contacts [3].

8. Smart security band [11]: This device is integrated with many sensors and wirelessly connects with the smartphone which has internet connection with the help of Bluetooth 4.0.

9. Smart women protector [12]: This device consists of esp8266, raspberry pi, fingerprint module, when the fingerprint is matched then the call and message will be sent.

10. Smart band [13]: This device is integrated with several sensors. GSM, GPS, and when this is out of control immediately current shock will be generated and SMS will be sent to the prime contacts.

11. Self-protecting kit [14]: In this product consists of various sensors, Arduino, GPS, GSM. using sensors situation is monitored by the application and when the situation is out of control then it will send messages.

The major limitations of the above projects are, for applications like VithUapp, life360 we have to pay a premium to use them and the message will not be delivered if there is insufficient balance. Moreover, these applications failed to make progress in countries like India. Ideas like SHE also has drawbacks because they are not suitable for all types of dressing styles. Smart belts and smarts shoes are also less effective because they cannot be worn in all aspects. Also, the projects with fingerprint sensors are not suitable for all the situations for example if the victim's hand is wet in that situation those projects fail their purpose. Other disadvantage of this is it cannot be used by multiple persons. According to some of the above projects, they should carry the mobile with them. If not, the device will fail to work. Some of these systems have sensors like heart rate, etc wherein if a person's blood pressure is increased due to some physical activities, etc even in such situations alerts will be sent unnecessarily without any reason of threats.

Other drawbacks include these are not easy to carry all time with us and are less comfortable and complex to use. Also, the cost of the devices is high. However, our smart locket is more comfortable, easy to use compared to other products. It is budget-friendly and even the size of the device is small, light-weighted, portable, easy to carry in any situation, and can be worn daily. It is activated simply when the button is pressed and turns off immediately once the required action is performed. Hence, the power consumption is also less, and it can sustain for many days just with a single charge.

III. PROPOSED METHODOLOGY

This paper introduces a new IOT based smart locket, and when we pressed the emergency button in the smart locket immediately the locket gets activated and then the required actions will take place and these have already been coded. The actions which will be taken are, within seconds buzzer makes a loud sound to grab attention by nearby people, text messages will be sent to the predefined contacts (like parents, friends, etc.), emails will be sent to the trusted predefined emails, call with voice message will be received to all the people who installed the application and logged in with those credentials. The block diagram of the system is shown in Fig 1.
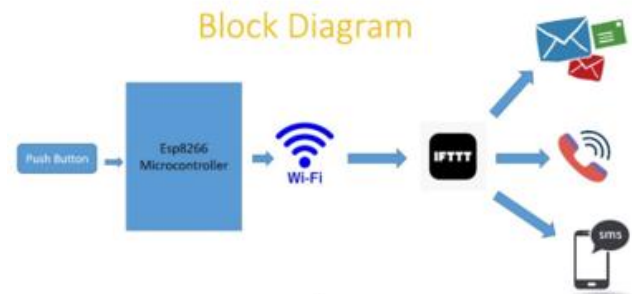

Fig 1: System Block Diagram

IV. HARDWARE DESCRIPTION

The components we required in this project are microcontroller ESP8266, push-button, battery, programmer, battery holder, and connecting wires. We connect the push button to reset and ground pins of the ESP8266 with help of shouldering and then connect the battery holder to ESP and push-button and then keep the battery in the battery holder. Finally, our smart locket is ready to use and after the hardware is prepared, we can cover it using 3d printing or resin to make it waterproof.

a) Push-button: Simple button which works on the simple mechanism to control any device or a machine or a process.

b) Esp8266 microcontroller: This is a low-cost Wi-Fi microchip and it is a self- contained System on Chip integrated with Transmission Control Protocol that allows access to the Wi-Fi network. It is efficient for hosting an app.

c) Battery: It converts chemical energy to electricity and is used as a source of power.
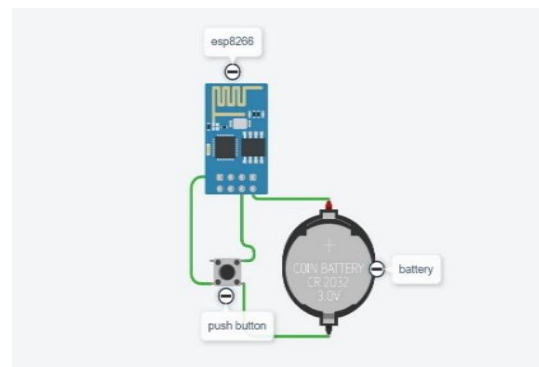
Connect all the components as shown in Fig 2.

Fig 2: Circuit Diagram: smart locket

V. PROCEDURE

The next step is to program the microcontroller using the programmer, here we have to write the code as per the requirement, and before going to programming for our project we have chosen the IFTTT [10] platform for the triggering.

The process is to take a smartphone and download the app named IFTTT from the play store and open the app after installation and continue with any one of the accounts, and press the button "create".

Then press on "if this" and then click on "webhooks" and then click the button "then that" and then you choose the required service like email or message or call and also, we should write for which email or phone, the alert should be received. Then press the button "connect", then press the explore button and the press "webhooks" and then go documentation and write the name of the event which you gave initially in place of the event, then the required link is ready and copy this link and then paste this link in resource1 of our code.

If you require 2 services (email and call) at the same time then follow the above procedure again 2 times and then paste this second link in resource-2.Major changes in code from person to person are SSID and password, here SSID is Wi-Fi name and password is Wi-Fi password and the server is IFTTT.

VI. WORKING

We should connect the locket to the internet with help of Wi-Fi or hotspot by smartphone, when we are emergency, we will press the button and then the predefined recipients will receive a mail, text message, call with a predefined voice message, then those contacts will immediately get information that our ward is in emergency and then further required action will take by these contacts.

Major mandatory rules that we required smart locket to work always are the locket should connect to either Wi-Fi or hotspot, always power should be available in the battery. Predefined recipients should be in-network areas to receive text messages, connected to the internet to receive an email, and the IFTTT app should be downloaded to receive a call with a voice message.

Mail and message will be received to the recipient without a download of the IFTTT app on the recipient's phones.

VII. RESULT

When we are in an emergency, we immediately press the button in the smart locket, and then immediately predefined recipients will receive the alerts as shown in the below Fig 3,4,5. As shown in the below figure we will receive a message from the person who is in emergency and we can also write the msg as per our requirement but we should write the required message which should be received during the procedure which we explained above.

SMS will be received to only one person, e-mails can be sent to 4 members, and voice messages through call will be received

to the people who downloaded the app and login with those credentials of the smart locket. Using this smart locket, we can alert many people at a time so that we can say that we have more percentage to save us from that situation.
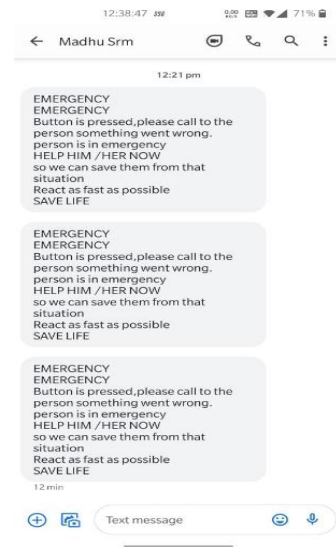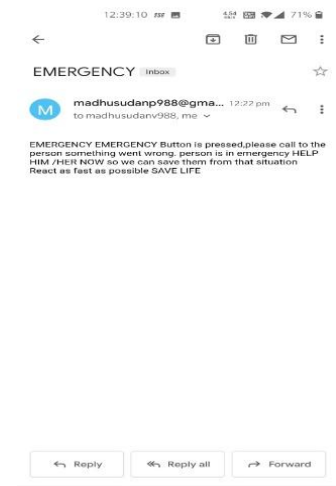

Fig 3: Message received when button pressed

Fig 4: E-MAIL received when button pressed

Fig 5: Call received when button pressed

VIII. ADVANTAGES

The smart locket is useful for many women in many emergencies and this is also useful for the people who are aged because nowadays we listening that many people losing their life at night time due to less assistance in that time by this locket they can alert their family members. This not only for the women this is also useful for dumb people to communicate, for their assistance.

By using the locket, we can decrease the late-night death, and also people will think before attacking women if women wear this kind of wearables. The major advantage in this locket is battery power will be used when we pressed the button until then no power will get lost and after the working of the function immediately it will go to sleep mode so by this, we will have less loss of power and we can use this for a long time.

IX. CONCLUSION

The fundamental point of our proposed system is to help women safeguard themselves from inconvenient circumstances and harmful attacks. This smart locket is economically friendly and is easy to wear. As the Internet of Things has enormous potential for improving various perspectives and in the current scenario due to the rapid growth in technology, we could easily design this system that helps to deal with problems faced by women. We can feel safe by wearing this locket and this will surely have a large impact as it helps reduce the crime rates with good accuracy. The smart locket is like a guard to people who wear it and when utilized in everyday life brings an extraordinary change as individuals become more aware of these gadgets and due to this, crime will reduce gradually. This can be used in many fields such as health care, security systems, etc. With additional advancements, this idea can be carried out in various zones of safety and can be used in numerous real-time scenarios.

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