IOT BASED SMART WEARABLE DEVICE FOR WOMEN SAFETY

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ABSTRACT

Women safety has been a big concern and it has been the most important duty of every person.There is no chance of the welfare of the world unless the condition of the women is improved. Since the ancient time, women are given most respected place in the society but every day and every minute some women of all walks of life (women, girls and babies) are getting harassed, molested, assaulted and violated at various places all over the world. It is estimated that 35% of the women have experienced physical and/or sexual violence at some point in their lives. This work deals with the development of smart wearable device for women safety using IOT. This consists of a device which can be used as a wearable in day to day life. When the girl is in danger the device is activated which will send the GPS coordinates for tracking to the android application developed which can be tracked regularly. It also consists of a camera module to capture the photos and send it to the app if the girl is in danger. The system also consists of an SOS alert to grab the attention of nearby people. The SMS Notification will also be sent to the family members and police station when the girl is in danger. This proposed wearable device can serve a solution to the problems faced by the learning if violated.

Keywords : OLED,IOT,LIPO Battery, Arduino IDE, PCB.

I. INTRODUCTION

In this twentieth-century where everyone is allowed to do whatever they want and to roam wherever they wish to go. There is a section or say half the section of the society who are still constrained to live their lives to the fullest. Yes, we are talking about females. Women are still suffering from various inequalities. According to the National Crime Records Bureau, in 2015, there were over 300,000 reported incidents, a 44% increase from 2011 crimes against women. They are the foundation of any economy essentially forming the eventual fate of the nation. She who earlier stayed at home to attend her domestic duties is now maintaining work and home simultaneously, participating in the process of economic development on an equal footing with men. So, it is the time to think about their safety and it is possible through IOT (Internet of Things). The main answer for the issue can be taken so that the women ought to be allocated with a well-being device that is convenient and guarantees her security. Our task centers around giving a Smart contraption dependent on IOT arrangements that not just serve to female get away from the basic circumstances but also additionally guarantees to give equality to the women. IOT is the colossal number of interconnected gadgets over the web fit for overseeing computerized undertakings adroitly with no direct human inclusion. As time is passing, an ever- increasing number of gadgets are being

interconnected and IOT is turning into an indispensable piece of our lives which permits us to play out the day by day undertakings quicker and proficiently, and in manners, we couldn't previously. In a perfect world, IOT will upgrade the future schedules with canny and solid frameworks that will make our way of life calm and furthermore adjust to the ever-developing needs. It will empower us to have totally robotized frameworks that will have its applications in making our security courses of action astute, by evacuating the client obstruction with any security gadget.

II. LITERATURE SURVEY

Before we start with the project a brief literature survey about the project was carried out. This involves studying the current approaches, the problems, the solutions provided by the different research scholars to arrive at the problem definition and propose and implement the solutions for the same. The number of research papers from different national and international journals was studied to arrive at the problem definition. Some of the important approaches and research work carried in this field is outlined in this section.

Seelam and Prasanti (2018)[1] says that in today's world women are less secure and have many issues regarding their security purpose. This paper describes about safe and secured electronic system for women which comprises of an Arduino controller and sensors such as temperature LM35, flex sensor, MEMS accelerometer, pulse rate sensor, sound sensor. A buzzer, LCD, GSM and GPS are used in this project. When the woman is in threat, the device senses the body parameters like heartbeat rate, change in temperature, the movement of victim by flex sensor, MEMS accelerometer and the voice of the victim is sensed by sound sensor. When the sensor crosses the threshold limit the device gets activated and traces the location of the victim using the GPS module. By using the GSM module, the victim's location is sent to the registered contact number.

Prof. Kiran et al(2017)[2] says that, in today's world, security is the major issue for an individual. In this project the system consists of a monitoring device, which gets activated when the device is tapped upon then a text message along with voice alert message is received by the respective emergency contacts. Further the person who receives the notifications can find and track the location without the interaction of the victim's application at each and every function.
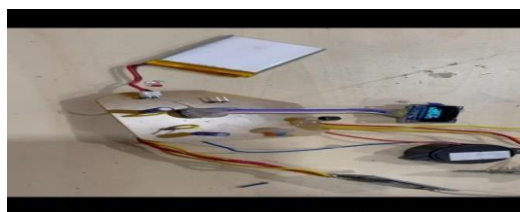
III. METHODOLOGY

Block Diagram Description
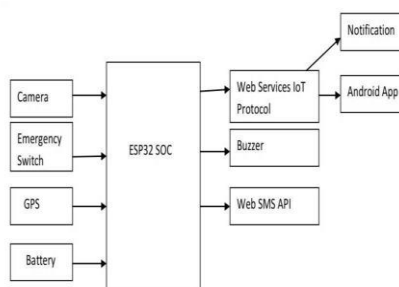
Figure 1: Smart wearable device for women safety block diagram

As shown in the diagram above the system consists of development of IOT based smart wearable device for Women safety. The system consists of an EPS32 SOC which is interfaced to the different sensors and the GPS

modem. The sensors such as push button will activate the device when the girl is in danger and start sending the GPS coordinates to the android application for live tracking as well as send the notification to the family members. The ESP32 SOC will take the data from the sensors as well as communicate with the cloud backend hosted remotely using web services API and IOT protocols. The GPS modem will fetch the live location and send it to the tracking application. The camera module will capture the live images and send it to the android application intermittently.

Figure 2.Hardware Design
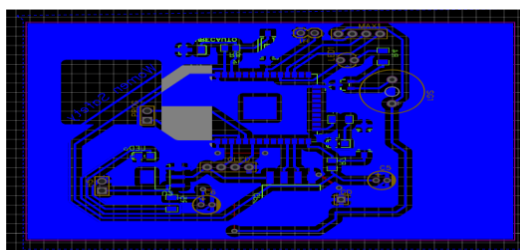
Figure 3. PCB Board

The following steps of methodology have been identified for the conduct of the project. The proposed system deals with the development of women safety wearable device and tracking on mobile application. The methodology to carry out the Work is as given below:

Literature Review and Problem Definition

Material selection

Interfacing Camera module to ESP32

Development of SOS alert system Development of GPS

tracking system   .

PCB hardware Design

Fabrication

Assembly

Programming

Android Application Development.

IV.COMPONENT DESCRIPTION

A.ESP 32 Wi-Fi SOC

Figure 4.ESP 32 Wi-Fi 33 SoC

WIFI module: ESP-WROOM-32

Processor: ESP32-D0WDQ6

Built-in Flash: 32Mbit

Antenna: Onboard PCB antenna

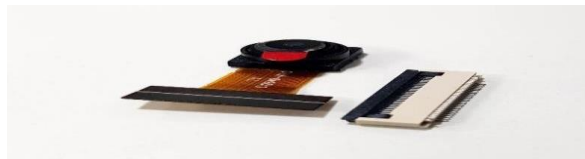Peripheral interface: UART/GPIO/ADC/DAC/SDIO/PWM/I2C/I2S

Wi-Fi protocol: IEEE 802.11 b/g/n

Bluetooth: Bluetooth 4.2

Frequency range: 2.4G ~ 2.5G (2400M ~ 2483.5M)

WIFI mode: Station / SoftAP / SoftAP+Station

B.OV2460 CAMERA MODULE:

Figure 5: Camera Module:

OV2640 is a 1/4-inch CMOS UXGA (1632*1232) image sensor Standard SCCB interface .Small in size. Video or snapshotoperation.

C.PUSH BUTTON

Figure 6: push button

The push button is used to activate the emergency mode. The 2-   leg pushbutton is use din this project.

D.UBLOX NEO6M GPS MODEM

Figure7: Ublox Neo6m GPS modem

E.OLED DISPLAY

Figure 8: OLED display

OLED (Organic Light Emitting Diodes) is a flat light emitting technology, made by placing a series of organic thin films between two conductors. When electrical current is applied, a bright light is emitted. OLEDs are emissive displays that do not require a backlight and so are thinner and more efficient than LCD displays (which do require a white backlight).

F.BUZZER

Figure 9: Buzzer

The buzzer consists of an outside case with two pins to attach it to power and ground.Inside is a piezo element, which consists of a central ceramic disc surrounded by a metal (often bronze) vibration disc. When current is applied to the buzzer it causes the ceramic disk to contract or expand. Changing the This then causes the surrounding disc to vibrate. That's thesound that you hear. By changing the frequency of the buzzer, the speed of the vibrations changes, which changes the pitch of the resulting sound.
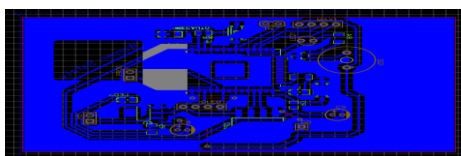
G.LIPO BATTERY

Figure 10: Lipo Battery

H.PCB DESIGNING
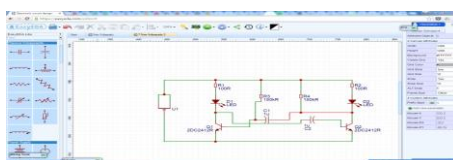
Figure 11: PCB Schematic Design.

Figure 12: PCB final layout

The hardware fabrication involves designing the PCB schematic in easy EDA softwareand then fabricating and making the connections to run the entire system. After the PCB fabrication is done the programming will be done to develop the border securityrobot.

The printed circuit board (PCB) acts as a linchpin for almost all of today's modern electronics. If device needs to do some sort of computation-such as is the case even with the simple digital clock. Chances are there is the PCB inside of it. PCBs bring electronics to life by routing electrical signals where they need to go to satisfy all of thedevice's electronic requirements.

There are three main types of circuit boards that get manufactured on a consistent basis, and it's important to understand the differences between each so you can decide the right circuit board for your requirements. The three main types of circuit boards in current manufacture are:

Parts of PCB

Substrate: The first, and most important, is the substrate, usually made of fiberglass. Fiberglass is used because it provides core strength to the PCB and helps resist breakage.Think of the substrate as the PCB's "skeleton".

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V. RESULTS & DISCUSSION

The software used to program the microcontroller is the Arduino IDE. Arduino is an open-source computer hardware and software company, project and user community that designs and manufactures kits for building digital devices and interactive objects that can sense and control the physical world. Arduino boards may be purchased preassembled, or as do-it-yourself kits; at the same time, the hardware design information is available for those who would like to assemble an Arduino from scratch. The project is based on a family of microcontroller board designs manufactured primarily by Smart Projects in Italy, and also by several other vendors, using various 8-bit Atmel AVR microcontrollers or 32-bit Atmel ARM processors. These systems provide sets of digital and analog I/O pins that can be interfaced to various extension boards and other circuits.

The boards feature serial communications interfaces, including USB on some models, for loading programs from personal computers. For programming the microcontrollers, the Arduino platform provides an integrated development environment (IDE) based on the Processing project, which includes support for C and C++ programming languages.
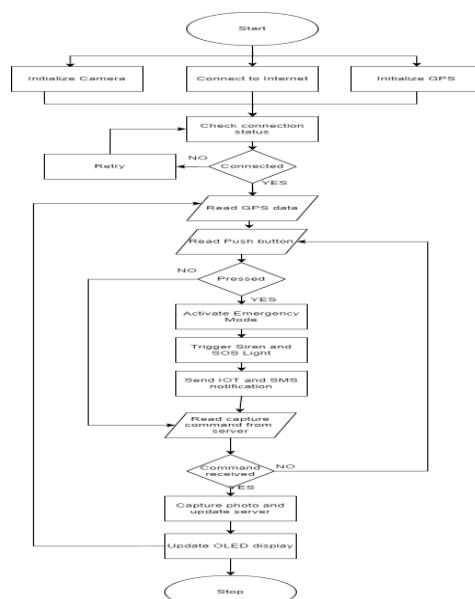
Flowchart of the system

Figure 13: Flow Chart

VI. CONCLUSION

 By doing this project we conclude that, women can travel through the any remote area at anytime. We can also provide the safety for the women. Even though she is in danger we can able to detect easily.

The project deals with the development of the women safety wearable device using IOT. We can conclude that the project can help keep the women safe by providing them with a wearable solution to tackle the ever increasing problem of women safety. From the implemented project we can conclude that the device will help the girls in danger to receive immediate help by providing them with a device to activate when in danger. Once activated the device will generate a SOS and also send the GPS coordinates which can be tracked using android application developed over IOT. The camera will capture images which will serve additional safety. Thus the device will serve as a safety device for women and avoid crimes against women

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