

Evolution of Raspberry-pi In Human Guarding System

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Abstract— At present each and every girl they are thinking about their safety because of the issues they are facing around. Every feels to move freely even in odd hours without any security. In order to overcome the problems faced by women a system is proposed to allow tracking of women from origin to destination. The proposed system is going to provide security to the women's and alerting the parents & higher officials to take further action. This is implemented by Raspberry-pi with ARM 11 Processor and interfacing wireless solenoid actuator with pepper spray. When the girl feels there is an any insecure and if she make the sound like danger then immediately the circuit will be activated and pepper spray will be released and next the camera will capture the eve teasers and send the photos to the higher officials through mail with the help of Wi-Fi. The location of the person can be send with help GSM & GPRS technology. In this work MEMS sensor will be activated whenever the girl fell in sick due to illness, then the sensed information will be delivered to the parents with a message called the girl is in sick along with a location. And also same message will be send to the people along with latitude and longitude values those whomever the app is installed from play store. By using this mobile application the girl can be protected even when the police arrival is late.

Keywords— IOT, Raspberry-pi3 (arm11processor), GPS, GSM, Android Application, Webcam, MEMS sensor

I. INTRODUCTION

In India there is a change in the status of women. At present they are facing social challenges. According to global poll conducted by Thomson Reuter some are the victims of abuse and violent crimes and,; India is the fourth cost dangerous country in the world for women. This work focuses on a security system that is designed safely to survive. The purpose of the project is to provide security and safety for the women so that they never feel helpless while facing such social challenges. The motivation for this project is the Delhi Nirbhaya and it was the time to change the situation of the women

II. LITERATURE SURVEY

Various GPS-based tracking systems have been successfully deployed and utilized in various applications such as vehicle location identification, and in route guidance. To provide real time data GPS and GSM technologies with Google earth are used so far. However GPS is not suitable for indoors and closed environments to track the location. To overcome that some may use Bluetooth technology. This exchanges the information through terminals. Mobile network is interfaced by the access point. In that solution they presumed that Bluetooth fixed infrastructures are expected to be installed in offices, homes and public areas which are not the case nowadays. The implementation of mobile indoor applications that delivers maps and linked database information to indoor wireless devices such as mobile, phones Users would then interact with the web pages and they can view the floor plans around their current location.

A GPS and GSM based women security system that provides the alert message is developed by R.A. Mahajan et al. in [1] with an emergency button trigger. Women security has become the fore most priority of the world. This system uses the Global Positioning System (GPS) technology to find out the location of women in trouble. The information about the location of women provided by the device can be viewed on Google maps using Internet or specialized software that they focused on the proposed model. The proposed model can be used to deal with the problem of security issue of women using GPS and GSM based tracking system.

A.Santhiya et al. [2] focuses on women tracking system for all working women. This system gives information about the woman's safety for their respective families. This system includes the button and two receiver modules for getting information about the missed women. When the button is pressed the message will be send with the help of GSM.

Android Application for the Safety of Women and this app can be activated by a single click, whenever need is required. A single click on this app identifies the location of place through GPS and sends a message to the registered contacts. This app will send the message to the registered contacts continuously for every five minutes until the "stop" button is pressed. Continuous location tracking information via SMS helps to find the location of the victim quickly and can be rescued safely proposed by Ravi Sekhar Yarrabothu et al. [3].

Authors in [4] proposed a system i.e. GPS and GSM based Women Security System provides the combination of GPS devices as-well-as provide alerts and message with an emergency button trigger. Whenever somebody is in trouble they only have to press volume key button after that a message alert is sent to registered contact list and a voice call to the number registered. At first it sends an alert called "I AM IN TROUBLE PLEASE HELP ME".

Either through voice switch or shock the device responds. And whenever the system is not in use, it automatically turns off to avoid unnecessary messages. It also detects the stress through forcing sensors and automatically gets activated and sends the location to police station and a message to registered mobile number.

A GPS and GSM based vehicle tracking and women employee security system developed by Authors in [6] that provides the combination of GPS device and specialized software to track the vehicle's location as well as provide alerts and messages with an emergency button trigger system uses the Global Positioning System. This paper deals with security issue of women employees by designing a GPS and GSM based vehicle tracking system. The tracking of vehicle will be done by placing the FM 1100 and the android device. FM 1100 will track the location it is activated when the device get interrupted.

Gowri Predeba.B et al. [7] suggest a new technology for the protection of women. The system resembles which when activated, tracks the location of the victim using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to three emergency contacts and the police control room. The system includes a screaming alarm which uses real time clock, to call out for help and also generates an electric shock to injure the attacker for self-defence. Risk and bring assistance when you need it. This paper focuses on a security system that is designed to serve the purpose of providing security to women so that they never feel helpless while facing such social challenges.

Best suitable system for those women will be a portable system which the women will be able to carry with her and easy to use. When a person attacks this system will generate a shock. After that a message will be sent to particular number with the help of Global System for Mobile Communication (GSM) and the location of those women is tracked with the help of Global Positioning System (GPS). If the message is not checked by the particular number mentioned, the system will continuously give the call until the message is checked by the particular number mentioned in work presented by [8].

Work presented in [9] discussed about one touch alarm system for women's safety using GSM. This system doesn't require a Smartphone. That means that even if the phone is not carried with the person, we can track the person easily with the help of watch. The system works like a normal watch which tracks the place of the women when activated using GPS and sends emergency messages using GSM to the contacts and the police control room.

Work in [10] suggests a new perspective to use technology to protect women. The system works like a normal belt which when activated, tracks the location of the victim using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to pre registered contacts and the police control room. The system includes a alarm that uses real-time clock to call out and also to have self defence it generates an electric shock to injure the attacker. This system doesn't require a smart phone as earlier. The belt itself will synchronize with the smart phone.

The implementation of women security system through RFID and GSM by Authors in [11] is to protect women. In case of any harassment, the women's were protected by wearing this watch or band can be saved. This watch or band is embedded with active RFID tag and On/Off switch where by switching on, the information is passed to RFID reader which communicates with 8051 microcontroller and through GSM the "help" message is sent to 4 predefined contacts i.e. Parents, friends, media.

Authors in [12] implemented the Women Security System. The users can press a button that is located on the watch with the help of RFID technology i.e. RFID tag is fixed in the watch or locket that contains information about unique ID and name. The RFID reader is fixed in mobile phone that receives radio waves and once the RFID tag is activated and emits radio waves, the RFID reader triggers the mobile phone and the processor will sends the messages "HELP" or location to 4 or 5 predefined contacts in which one is for police women cell.

Smart band continuously communicates with smart phone that has access to the internet. The application is pre loaded with human behaviour and reactions that act at different situations like anger, fear and anxiety. This signal is transferred to smart phone. Authors in [13] implemented the software or application has access to GPS and Messaging services which is pre-programmed in such a way that whenever it receives emergency signal, it sends help request along with the location co-ordinates to the nearest Police station, relatives and the people in the near radius who have that application. This action enables the help instantaneously from the police as well as public in the near radius who can reach the victim with great accuracy.

Nitin Swagand Ravindra et al. [14] proposed the (IOT) Internet of things based tracking system from origin to destination. IOT describes how daily life objects interact and communicate with other objects over the internet. IOT is big support which will give platform to connect every device using the cloud computing technology, where different devices can connect with one single device. When we want to trace the person, we need to send a message to the particular person then the system immediately traces the location and automatically resends the message with latitude and longitude values.

In the survey the problem identified is that whenever an incident or action occurred in the nearby surroundings, the eve teasers may not stay there by police reaches the location. So in order to make the system reliable, the snapshots of the particular eve teasers can be captured and sent to the control room through a mail. In order to implement this we are using the raspberry-pi technology. The advantage by using this project is that we can easily identify the eve teasers. Based on the above observations, the proposed system is to design a portable device which resembles like a chain. It consists of MIC/sound sensor Raspberry pi 3, GSM modem, GPS receiver, screaming alarm, and Tear gas. When the girl shouts louder then immediately the device will get activated automatically with in a fraction of milliseconds. Immediately the location of the victim will be tracked and messages will be sent to emergency Smart Intelligent Security

System for Women contacts this activates alarm unit which produce a siren sound to call out for help. To escape the victim tear gas can be applied to the attacker. Then the camera will capture the eve teasers and send to the higher officials. So that it help to detects the face of the attacker along with the surrounding environment that helps to find out easily.

III. METHODOLOGY

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A. Proposed Block Diagram

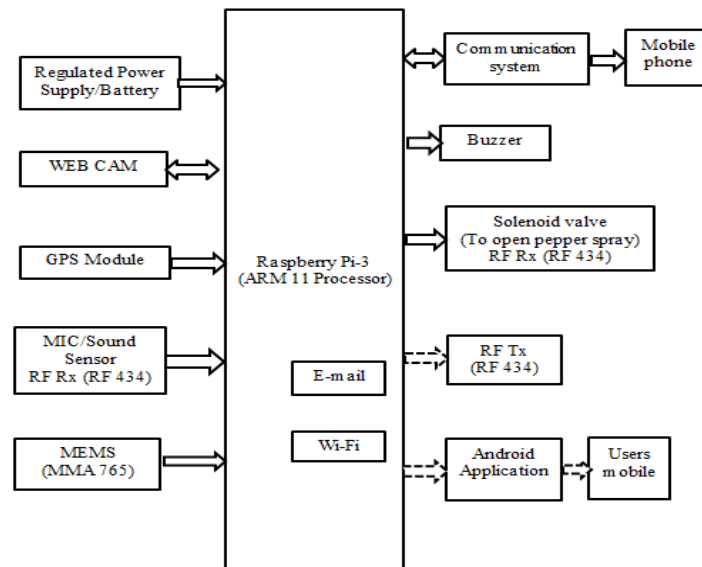


Fig. 1 Block diagram

B. Flow Chart

The stream outline speaks to well ordered technique of the framework it comprises of choice box, restrictive box and so on. At first we need to introduce the framework that implies we need to enter all the required things that the framework to work. At the main stage we need to interface the framework with a similar system and switch on the power supply. When we make the sound like risk then the framework will be actuated promptly it checks the status of the sensor, next if the solenoid valve is enacted it showers the pepper splash, next the camera will catches the eve secrets photographs and the data will be conveyed to the higher authorities with the assistance of WI-FI through mail later it follows the area and the sends the scope and longitude esteems to the higher authorities and guardians. At the point when the MEMS sensor is enacted that demonstrates the fall in sick and it sends the message like the young lady fall in sick because of ailment to the guardians when every one of the conditions are genuine the framework will play out the task else it again return to the underlying stage.

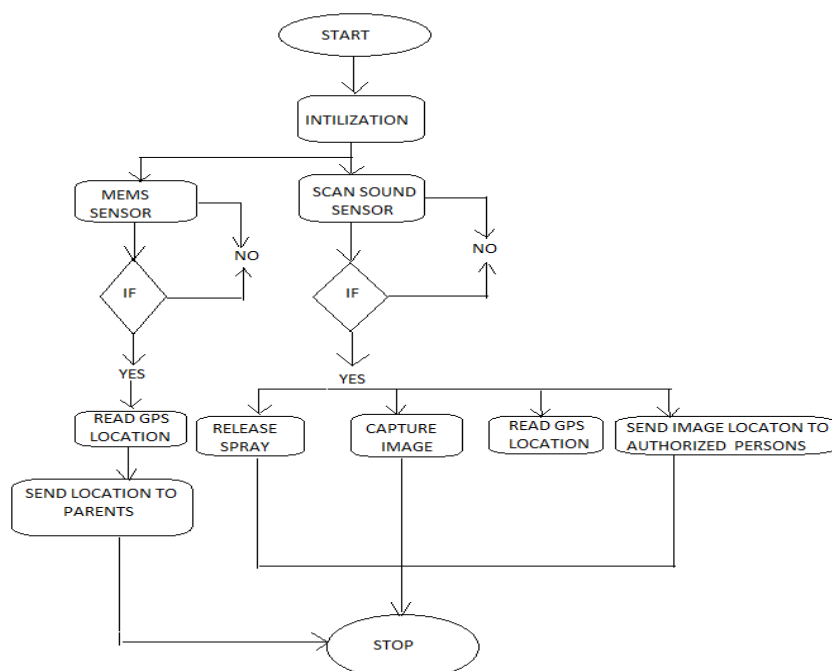


Fig.2 Flow chart of women guarding system

C. IOT & RASPBERRY PI-3

The Raspberry Pi is a movement of minimal single-board PCs made in the United Kingdom by the Raspberry Pi Foundation to propel the teaching of basic programming building in schools and in making countries. The main model injury up substantially more conspicuous than predicted, offering outside its target advertise for usages, for instance, mechanical innovation. It excludes peripherals, (for instance, consoles, mice and cases). Nevertheless, a couple of ruffles have been joined into a couple of official and casual packs. As shown by the Raspberry Pi Foundation, in excess of 5 million Raspberry-Pi were sold by February 2015, making it the highest point of the line British PC. By November 2016 they had sold 11 million units, and 12.5m by March 2017, making it the third first class "comprehensively helpful PC". In July 2017, bargains came to very nearly 15 million. In March 2018, bargains accomplished 19 million. Raspberry Pi 3 Model B was released in February 2016 with a 64 bit quad focus processor, and has on-stack up Wi-Fi, Bluetooth and USB boot abilities. On Pi Day 2018 model 3B+ appeared with a snappier 1.4 GHz processor and a 3 times speedier framework in perspective of gigabit Ethernet (300 Mbit/s) or 2.4/5 GHz twofold band Wi-Fi (100 Mbit/s). Different decisions are: Power over Ethernet (POE), USB boot and framework boot (a SD card is never again required). This allows the usage of the Pi in hard to-accomplish places (maybe without power).

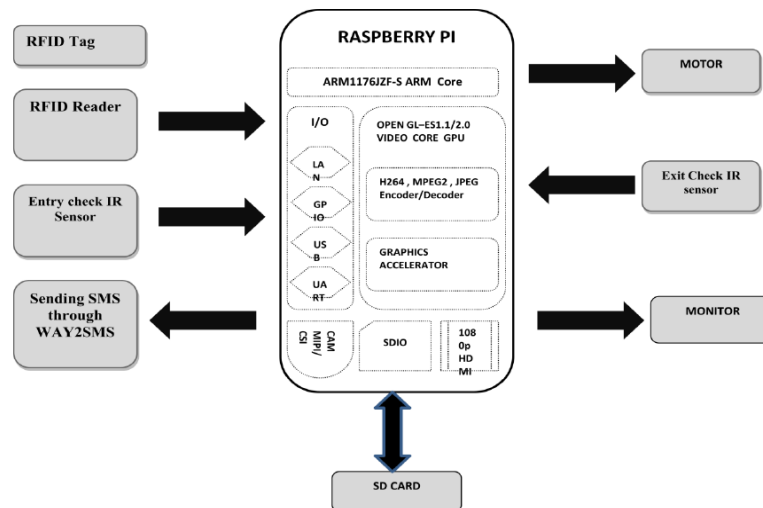


Fig.3 Raspberry Pi-3 based diagram

D. ARM 11 Processor

ARM11 is a gathering of more seasoned 32 bit RISC ARM processor centers authorized by ARM Holdings. The ARM11 center family comprises of ARM1136J (F)- S, ARM1156T2 (F)- S, RM1176JZ (F)- S, and ARM11MPCore. Since ARM11 centers were discharged from 2002 to 2005, they are never again suggested for new IC plans, rather ARM Cortex-An and ARM Cortex-R centers are favored. ARM represents Advanced RISC Machine. The ARM11 depends on the ARMv6 Instruction set engineering. Bi-endian – can work in either little-endian or enormous endian design. Most gadgets today utilize little-endian. As a matter of fact utilizes two guidance sets – the 32-bit ARM and the 16-bit Thumb.

E. GPS Receiver & GSM SIM 900

GPS Module reliably gets the data from the satellite and transmits correspondingly to the RS232. It is created by US division of shield The GPS signal is associated with the radio wire commitment of module, and a whole sequential data message with position, speed and time information is shown at the sequential interface. The present date, time, longitude, scope, tallness, speed, and travel bearing among other data, are given by the module and can be used as a piece of a various applications including course, following frameworks, mapping and mechanical innovation. The module can reinforce up to 51 channels. The GPS course of action enables little casing element contraptions which pass on genuine movements in GPS shows, accuracy, coordination, figuring power and flexibility. They are used to streamline the embedded framework mix process. The SIM900 is an entire Quad-band GSM/GPRS arrangement in a SMT module which can be installed in the client applications. Including an industry-standard interface, the SIM900 conveys GSM/GPRS 850/900/1800/1900MHz execution for voice, SMS, Data, and Fax in a little frame factor and with low power utilization. With a little setup of 24mm x 24mm x 3 mm, SIM900 can fit all the space prerequisites in your M2M application, particularly for thin and reduced interest of structure.



Fig.4 SIM 900 GSM Modules

F. Android Mobile

Android's default UI is principally in perspective of direct control, using contact inputs that openly contrast with genuine exercises, for example, swiping, tapping, pressing, and modify crushing to control on-screen objects, close by a virtual console. Amusement controllers and full-measure physical consoles are reinforced by methods for Bluetooth or USB. The response to customer incorporate is proposed to be provoked and gives a fluid touch interface, much of the time using the vibration limits of the contraption to give haptic analysis to the customer. Internal gear, for instance, accelerometers, whirlygigs and region sensors are used by a couple of uses to respond to additional customer exercises, for example modifying the screen from picture to scene dependent upon how the device is arranged, or empowering the customer to manage a vehicle in a hustling beguilement by rotating the device, duplicating control of a coordinating wheel.

Android contraptions boot to the home screen, the basic course and information "focus point" on Android devices, for all intents and purposes comparable to the work region found on PCs. Android home screens are normally included application images and devices; application images dispatch the related application, while devices indicate live, auto-reviving substance, for instance, an atmosphere guess, the customer's email inbox, or a news ticker clearly on the home screen. A home screen may be contained a couple of pages, between which the customer can swipe forward and in reverse. Pariah applications available on Google Play and other application stores can comprehensively re-subject the home screen, and even duplicate the look of other working structures, for instance, Windows Phone. Most makers change the look and features of their Android contraptions to isolate themselves from their adversaries.

Along the most noteworthy purpose of the screen is a status bar, demonstrating information about the contraption and its system. This status bar can be "pulled" down to reveal a notice screen where applications demonstrate fundamental information or updates. Alerts are "short, favorable, and appropriate information about your application when it's not being utilized", and when tapped, customers are facilitated to a screen inside the application relating to the notice. Beginning with Android 4.1 "Stick Bean", "expandable admonitions" empower the customer to tap an image on the notice with the ultimate objective for it to broaden and demonstrate more information and possible application exercises perfect from the notice.

An All Apps screen records all presented applications, with the limit with respect to customers to drag an application from the summary onto the home screen. A Recent screen allows customers to switch between starting late used applications. The SDK fuses an expansive arrangement of progression tools,[85] including a debugger, programming libraries, a handset emulator in perspective of QEMU, documentation, test code, and instructional activities. At first, Google's supported joined progression condition (IDE) was Eclipse using the Android Development Tools (ADT) module; in December 2014, Google released Android Studio, in perspective of Intelligent IDEA, as its fundamental IDE for Android application enhancement. Other progression contraptions are open, including a neighborhood enhancement kit(NDK) for applications or extensions in C or C++, Google App Inventor, a visual area for student programming engineers, and distinctive cross stage flexible web applications frameworks. In January 2014, Google revealed a framework in light of Apache Cordova for porting Chrome HTML 5 web applications to Android, enveloped by a neighborhood application shell.

Android has a creating assurance of third-social affair applications, which can be picked up by customers by downloading and introducing the application's APK (Android application bundle) record, or by downloading them utilizing an application store program that enables clients to introduce, refresh, and expel applications from their gadgets. Google Play Store is the essential application store introduced on Android gadgets that conform to Google's similarity prerequisites and permit the Google Mobile Services programming. Google Play Store enables clients to peruse, download and refresh applications distributed by Google and outsider engineers; starting at July 2013, there are more than one million applications accessible for Android in Play Store. Starting at July 2013, 50 billion applications have been introduced. A few transporters offer direct bearer charging for Google Play application buys, where the expense of the application is added to the client's month to month bill. As of May 2017, there are more than one billion dynamic clients multi month for Gmail, Android, Chrome, Google Play and Maps

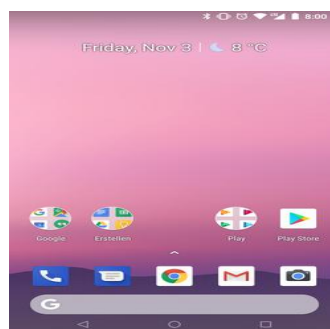


Fig.5 Android app home page

A webcam is a camcorder that feeds or streams its picture progressively to or through a PC to a PC organize. Whenever "caught" by the PC, the video stream might be spared, seen or sent on to different systems by means of frameworks, for example, the web, and messaged as a connection. At the point when sent to a remote area, the video stream might be spared, seen or on sent there. In contrast to an IP camera (which associates utilizing Ethernet or Wi-Fi), a webcam is commonly associated by a USB link, or comparable link, or incorporated with PC equipment, for example, PCs. The expression "webcam" (a cut compound) may likewise be utilized in its unique feeling of a camcorder associated with the Web ceaselessly for an inconclusive time, instead of for a specific session, for the most part providing a view for any individual who visits its website page over the Internet.

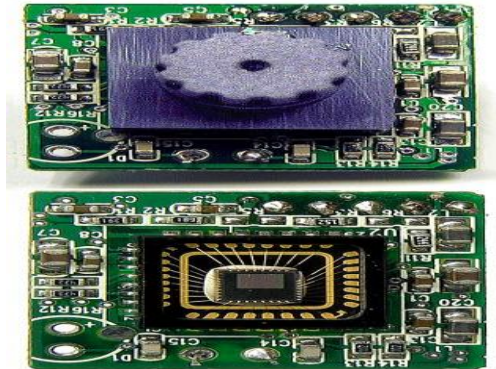


Fig.6 Webcam internal circuit

H. MEMS Sensor

MEMS innovation could connect an inkjet printer head, a video projector DLP framework, a dispensable bio-investigation chip and an airbag crash sensor - indeed, they are altogether MEMS, yet what is MEMS? Smaller scale Electro Mechanical Systems or MEMS is a term begat around 1989 by Prof. R. Howe [2] and others to portray a rising exploration field, where mechanical components, similar to cantilevers or layers, had been produced at a scale more much the same as microelectronics circuit than to machine machining. It creates the impression that these gadgets share the nearness of highlights beneath $100\mu\text{m}$ that are not machined utilizing standard machining but rather utilizing different systems comprehensively called smaller scale manufacture innovation. Obviously, this straightforward definition would likewise incorporate microelectronics; however there is a trademark that electronic circuits don't impart to MEMS. While electronic circuits are innately strong and minimal structures, MEMS have openings, depression, channels, cantilevers, films, and so forth, and, somehow or another, copy 'mechanical' parts. The accentuation on MEMS dependent on silicon is unmistakably an aftereffect of the tremendous information on silicon material and on silicon based small scale manufacture picked up by many years of research in microelectronics. What's more, once more, notwithstanding when MEMS depend on silicon, microelectronics process should be adjusted to provide food for thicker layer statement, more profound drawing and to acquaint exceptional strides with free the mechanical structures. MEMS needs a totally unique arrangement of psyche, where by gadgets, mechanical and material learning assumes a crucial job.

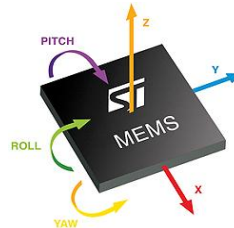


Fig.7 MEMS sensor

IV. EXPERIMENTAL RESULTS



Fig.8 Hardware description



Fig.9 Women with security system



Fig.10 Release of spray when the sound sensor is activated

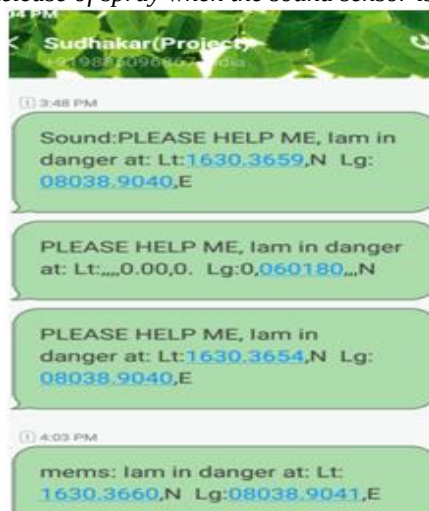


Fig.11 Message delivered to parents and higher officials

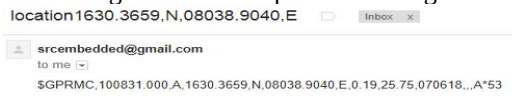


Fig.12 Victim image sends to the higher official's mail

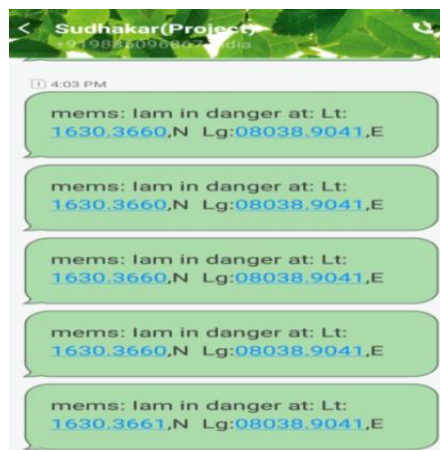


Fig.13 Message delivered to parents when the girl fell in ill

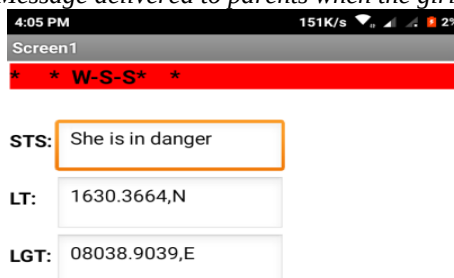


Fig.14 Mobile app for women security which send the location to app users

V. CONCLUSION

The paper presents arranging about the essential issues looked by women at display days and will settle them mechanically with insignificant equipment and musings. Using wrist band and scenes, the frameworks like toxic gas release, yelling alerts and besides disturbing the emergency contacts by sending the messages with the territory. This framework can beat the fear that freezes every woman in the country about her prosperity and security. The future extent of the framework is wide. By consolidating every one of these highlights, this can be an entire human security observing framework. The applications are truly boundless. Wherever, information checking, remote sending and remote controlling is required, a similar framework is appropriate straightforwardly with little alterations, for example, giving security without utilizing web, intermittently taking the camera shots, by sending the voice message that can be anything but difficult to settle issue. The whole framework can be shaped in a solitary wrist watch. In this manner such a framework can be executed utilizing an ease PC like Raspberry Pi which can work like a scaled down PC. The most recent headways of innovation and new sheets coming each day, it obvious that every inserted application and frameworks will be executed as IOT application.

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