Design and Implementation of a Novel Device for Women Security using RFID and GSM Technologies

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***Abstract*—Today women are working during day and night time also, hence security has become the major concern. With the increase of crime against women like rape, theft, kidnap, acid throwing, domestic violence and dowry violence. Therefore women security is a prime factor these days. To provide security for women a novel model is proposing with dual security feature which includes two types of security system; one is used to generate a shock by which the message is sent through GSM (Global System for Mobile Communication) technology used in bracelet. Another one is implemented on a sandal using RFID (Radio Frequency Identification) technology by which message is sent to predefined contacts. Integration of these two technologies forms new system providing dual security for women. Since the proposed model is integrated with two devices, hence the devices are connected using Bluetooth.**

Keywords: GSM, RFID, dual security, Bluetooth.

I.INTRODUCTION

Our life has become too fast and too busy in these days. To be a part of this fast life women also works a lot to survive and supports their family. Being safe is the first and main priority in one's life and their family They work at different places like IT firms, garments,BPO's, call centres, garments and so many places [1].The call centre and BPO jobs are scheduled for late night. After completion of their duty they have to go home late night so anything may happen at such timings as well as there is a chance of harassment at lonely places. Now a days, there is no security for women in day time also many incidents now a days happens in day time also .To provide a security and safety for women this purpose portable system is designed which can be easily carried with the women[2].

Today women are working during night time as well as day time, hence security has become the major concern. With the increase of crime against women like theft, kidnap, domestic violence, honour killing, acid throwing, sexual offences rapes, molestation, trafficking, forced prostitution. Therefore now a days there is no security for women. Hence women security is a prime factor these days.[4]

Records Bureau (NCRB)[12], crimes against women have more than doubled over the past ten years. Approximately 2.24million crimes against women are reported over the past decade, 26 crimes against women are reported every hour or one complaint for every two minutes. Rape is the most crime reported against women, molestation is the next most reported crime against women, kidnapping and abduction is the third most reported crime against women followed by rape and molestation [12].

In New Delhi, crime against women has gone up by 20% in 2015 as compared to 2014 and there has also been increase in registration of rape cases. In Bengaluru, 2608 cases of crimes are registered against women in the year 2013.

From the above mentioned statistics, it is understood that crimes are increasing exponentially day by day. Hence the security has become a living necessity these days. As all know that life cannot be compensated for any issue of matter, it is significantly important provide guarantee security for women during critical situations. So there are several devices exist to provide safe future for women which are discussed below.

II.OBJECTIVE

Our main objective or intention of device is to provide security to the women. Our device is simple, easy to carry, with great accuracy. It consists of two devices. One device makes use of Global System for Mobile Communication (GSM) technology. The other device uses Radio Frequency Identification (RFID) technology. The two devices are connected by Bluetooth. There would also be an android app which would send SMS to the entered number.

III.MOTIVATION

The main motivation is to provide dual security for women as the crime against women are prevalent these days. Today women are working during day and night time as well, hence security has become the major concern. With the increase of crime against women like rape, theft, kidnap, domestic violence, dowry violence, honor killing, acid throwing etc. Therefore there is no security for women. Hence women security is a prime factor these days.

According to the latest data released by the National

Crime Records Bureau (NCRB), crimes against women have more than doubled over the past ten years. Approximately 2.24million crimes against women are reported over the past decade, 26 crimes against women are reported every hour or one complaint for every two minutes.

Therefore the device basically deals with the safety of women during the adverse situations. So we have come up with a novel device which uses two technologies inter connected via Bluetooth.

IV.LITERATURE SURVEY

A. Smart device for women safety

This is a smart foot device which is developed to safeguard the women whenever she feels unsafe. This device makes use of Internet of Things coupled with Bluetooth wireless connection.

The LBM313 BLE module can support a moderate range of data rates that is 250kbs to 1mbs and it also operates at a voltage in the range between2 to 3.6v.As it is a device with small range so we use bluetooth device as it consumes less energy, less power consumption for it to work. This device will alerts that device is in sleep or asleep mode. In addition to these features bluetooth supports within 100 meters as it is a low energy consumer.

A digital triaxial acceleration sensor technolised device accelerometer which is used in BMA250.This triaxial sensor is used to measure the acceleration in 3 perpendicular axes and also it use to sense the motions like tap, tilt etc.. This sensor depends on the actions or the motions of the footwear how it is turned by the user. When the women taps her foot with her footwear device by other or from back ,the sensor in that footwear will senses the action and it will alerts the women that she is in danger. [1].

The GPS module which is used in the phone is used to track the position of the person and the emergency message is sent along with the position to the contacts already defined in the phone[5].

B. Safety Gadget for Women

The components used in this device are GSM modem, GPS module, a microcontroller, safety and zapper. The GSM modem is used to send the emergency messages via the sim card present in it ,GPS is used to track the location along with latitude and longitude values and microcontroller is used for efficient programming, and the emergency message is sent to the predefined contacts.

C. Smart Gadget for women

The device uses GSM module to help the women in adverse situations. The device is like a bracelet that can be worn in hand as a wrist watch. Whenever the women faces any adverse situation the woman can hold the button present in the device. This device uses PIC microcontroller and sends emergency messages using the GSM(Global System for Mobile communication), to pre defined contacts

The PIC controller acts as a component for calculating the peripherals. We are linking a GSM module and GPS module together. Hence on pushing the button it sends to all the predefined contacts also the police room if needed. The main advantage of this is we don't need any smart phone. The contacts will automatically receive the message from the women in critical situation [6].

D. A Mobile Based Women Safety Application

This a is an application which is designed for the safety of women. This will help from the unwanted or fake meetings,fake calls in the work. To escape from all these,as there is no application to detect fake or real things. Hence this application is designed so that any person is in any danger or unsafe situation then he has to inform his family or friends by calling which takes much time so the designed application uses a panic button that by press that a message is sent to the people mentioned in the application with the alert.

The drawbacks of this application are

When the person is in problem, he cannot call someone and explain the situation and cannot give the details of the location as person may be alone. By using this application, when person is in danger situation the he press panic button from his mobile which is connect to this application which will send alert message
to the predefined contacts in the application along with the location where the person situated. Their can be a situation where at night a person can be out as finishing the work or a person travel alone a danger situation. At that situation this mobile safety application helps the person to feel safe and helps in handling the danger situation.

In this application, the person need gives details like name and contact number where at emergency situation a message is send to them with the location. A person can add multiple contacts in the application. To send the alerts message user has to press the button with the name SOS as pressed it will send the ,message to the predefine d contacts. In the message sending can have anything like "help" or "I'm in danger" etc. User can send an audio message or can make video call and explain the situation. This application also gives the information about the first aid which helps in the emergency situation.[7]

E. Portable Device for women security

This is the device which sends message mainly on shock generator. When a person is attacking a shock is generated by the portable device which will help the person in the danger. A message is sent to the particular number which is stored after the shock is generated. A message is sent with the help of Global System for Mobile Communication(GSM) and the location of the woman can be traced with the help of Global Positioning System(GPS).

A call is given to that particular number continuously when the person does not check the message by the device. Call is given until the message is checked by the particular contacts.

The main advantage of this device is that a call is given to that particular number continuously when the person does not check the message by the device all is given until the message is checked by the particular contacts. Other advantage is that we can multiple contacts, when a call is rejected or message is not checked then message is sent to the next contact and this process goes on.

F. Suraksha device

This is a simple and an easy device to carry It consists of a button,whenever this button is pressed emergency message is sent to registered number and police control room via transmitter module and location is sent via gsm module.This gives abasic idea to flash an insistency message to contacts registered[10].

G.VithU app

It is an emergency app in mobile .This app consists of a button, whenever this button is pressed two times consecutively an emergency message is sent to registered numbers for every two minutes[9].

V.DESIGN OF SECURITY SYSTEM

The security system can be implemented using RFID and GSM technologies. As shown in Figure 1, the security system implemented using RFID technology has RFID readers and tags as main components, i.e., tags are used for object identification these can be either active or passive, readers used to send signals to tags and read its response. As shown in Figure 2 security system implemented using GSM technology has GSM modem and GPS module as main components, i.e.,modem is used to send and receive data through GSM network and GPS module is used to track the object location.

A. IMPLEMENTATIONUSING RFID TECHNOLOGY

In this section, we introduce our women security system implementation using RFID technology including its main components.[2]

i)RFID Tags

A radio-frequency identification system uses *tags*, which are attached to the objects to be identified. These are passive, active or battery-assisted passive. An active tag has an on-bord. There is a battery assisted passive tag (BAP) where it is used to receive signal from the active tag. A passive tag is smaller because it has no battery; instead, the tag uses the radio energy transmitted by the reader.[3].

ii)*RFID Readers*

RFID systems can be classified by the type of tag and reader used. A Passive Reader Active Tag (PRAT) system has a passive reader which only receives radio signals from active tags.AnActive Reader Passive Tag (ARPT) system has an active reader, which transmits interrogator signals and also receives authentication replies from passive tags.[3].

B.IMPLEMENTATION USING GSM TECHNOLOGY

In this section, we introduce our women security system implementation using GSM technology including its main components[1].

i)GSM Modem

A GSM modem is a type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone[4].

Fig. 1 Complete GSM Modem System.

ii) GPS Module

Global Positioning System is one of the widely used mobile standards. As the name specifies, it enables the mobile users to interact all over the world at any time. It provides geo-location and time information to a GPS receiver in all weather conditions[4].

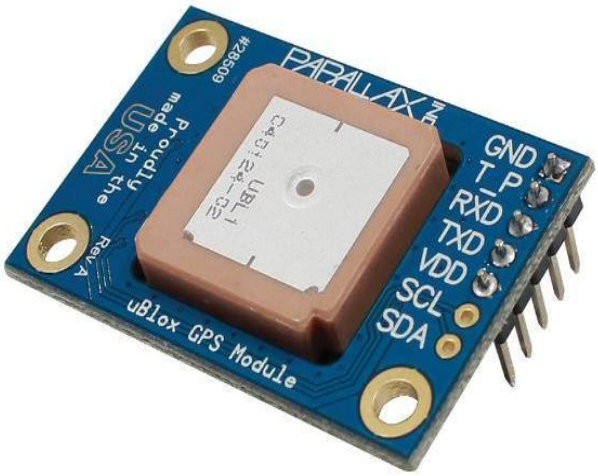

Fig.2 Complete GPS Module System

VI. SYSTEM DESIGN

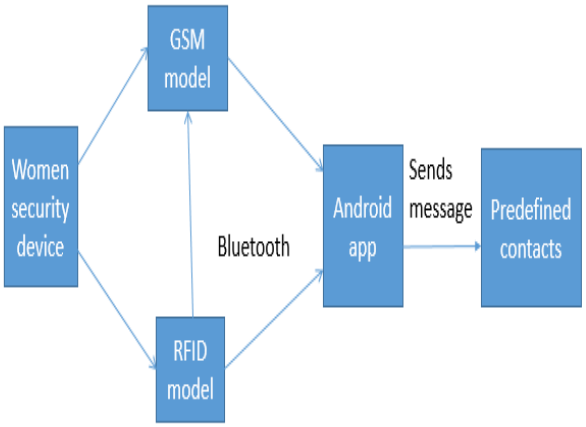

Fig. 3 Block diagram of proposed system

The above represents the block diagram of the proposed system where it is incorporates two technologies called GSM and RFID.As it is a security device it should be easily available so these are incorporated in bracelets and sandals. A panic button is provided in the button which consists of GSM technology where a shock is generated when button is pressed with the help of it will send the message through android application which is connecting with this bracelet. In case of any failure in the GSM technology there is an another device which is incorporated in sandal consists of RFID technology.

Both the technology are inter connected with wireless connection that is Bluetooth .In RFID technology it uses radio frequencies around there and get the longitude and latitude and message is send through android application. In android application user need to be registered before only by giving her details along with the contacts to which the message has to be sent so that it will be easy while sending.In this system all the devices are connected via Bluetooth so that it is easy for detection of device and connect.

A. Dataflow diagram

As shown in Figure 4, whenever a women feels that she is in insecure condition then she can press the emergency button that is provided in the bracelet. When this panic button is oppressed the device will be connected to the app and the application triggers predefined insistency SMS along with longitude and latitude of the location to be sent to the predefined contacts by using GSM technology system components. If this GSM technology fails to send the message then message can be sent by using RFID technology system components .Thus if any one of the technology fails in some circumstances the device provides security using other technology. Hence an integrated electronic device which incorporates both GSM and RFID technologies provides extended dual security for women.

In the data flow diagram, the RFID technology makes use of two tags active tag and passive tag. Here active tag acts like a reader which reads the information from the atmosphere and for reading long distance messages. The passive tags so used to transmit the electromagnetic energy read by the active tag to the app so provided or implemented.

The GSM technology uses a GPS to get the details of the location along with the longitude and latitude values. The sim card details that are provided in the GSM module. Hence we see two devices having two technologies coupled together so that if one device fails the second device can come into action. Thus the security is enhanced and women is safe where ever she goes.

The probability of failing of any device is very less because GSM technology works in almost all the situations. However the availability of radio frequency might change from place to place. If it is a little windy the frequency of the surroundings might change and hence the location also changes.

Thus the system is very secure with two coupled technologies and it is compact to use as well as to carry from one place to another.

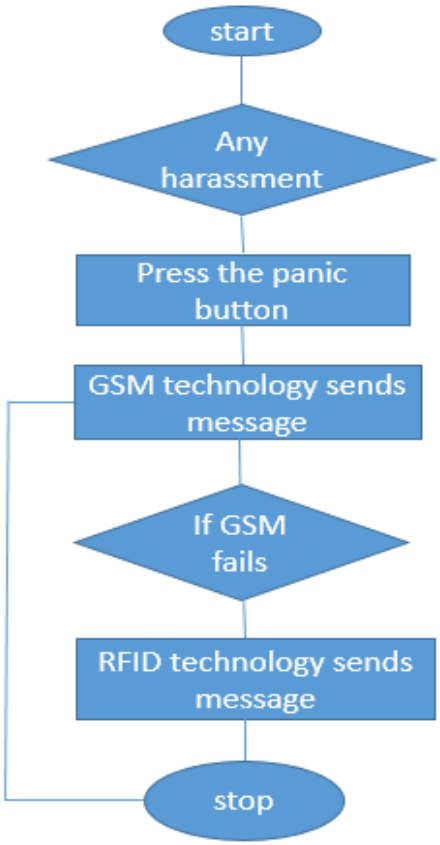

Fig 4. Dataflow diagram of a security system

B. Comparison of Technologies

It is table which will compare the proposed technology with the other technologies based on the different parameters as shown in table 1. It will help in knowing about the proposed technology and what are the advantages of using this technology .As it is using the table format, it can be easily readable, easily understandable.

The table consist of attributes where comparison is done based on security as it is the main objective of the device, technology which is used in design of the device, connection the device works on, portability of a device on which platform the device works, accuracy level of the device, cost of the device so that it should be affordable and flexibility of a device. From the table given below it is clear that there is no such device which provides dual technology.

There are various android applications such as Vithu app, Women Safety etc. Here the apps use GPS technology to track the location of the women present in some critical situations. Thus we are proposing a device which makes use of two technologies GSM(Global System for Mobile Communication) and RFID(Radio Frequency Identification) to send messages to the pre-defined contacts whenever women feels that she is insecure.

PROPERTIES	OTHER TECHNOLOGY	PROPOSED TECHNOLOGY
Security	Secured	Highly secured
Technology	One technology is used	Two technologies are coupled
Flexibility	Less flexible	More flexible
Accuracy	Less accurate	More accurate
Portability	Less portable	More portable

Table 1 Comparison of technologies

VIII CONCLUSION

The device is a novel device which has coupled two technologies GSM and RFID. The GSM uses GPS modem to get the location. Also it uses Radio Frequency Technology where due to presence of radio waves in the atmosphere it sends the location. The two devices are interlinked with one another via Bluetooth. Also the devices are interlinked with the mobile phone via Bluetooth. The main motive of the devices is to protect the victim who is in some adverse situations. The two devices link with one another and with a mobile app. The mobile app has some predefined contacts and a pre defined message. So during adverse situations the app will senda message to the pre defined contacts along with the location. So if we are using two the main advantage is if one device fails the second device will come into action and the message would be sent from that second device.

There are emerging technologies like connecting the devices through Wifi. Since we are using two devices so we want there must be a single device where both the technologies are coupled together.

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