

# IoT Based Support System

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## ABSTRACT

This IoT based support system is an attempt on extending a contribution into lowering the increasing crime rates against children and adults with awareness and technology. The most powerful tool to this race is technology and through it, we want to provide the basic protection and safety assurance to the users. The proposed device/procedures are aimed to provide solution in case of emergencies. The plan is to merge a hardware device with the smartphones that we carry with ourselves daily. The use of the applications of that phone, without physically using it is the focal point of the project. It can be used as an advanced SOS device or a tracking device and can also we developed into a fit band.

**Keywords :** Internet of Things (IoT), safety device, SOS device, emergency, hardware device, microcontroller, Bluetooth module, distress call, sound recording.

## I. INTRODUCTION

We use our smart phones for atleast 4-5 hours a day for various purposes but we sometimes encounter situations where there is a real need to use them. These are the emergency situations that are uncalled and our phones act as a saviour rather than a distraction. These situations could be road accidents, physical accidents, cases of physical and sexual assault and harassment, kidnapping or lost locations. During these cases we need our phones to reach out to people who can help us but the physical constraint of each of these situations leave us in a position where either we cannot take out our phones or even if we can, the adrenaline imbalance results in poor locomotive skills. The increasing crime rates against women and children is a factor of great concern in this growing age of freedom and equality. So the purpose of this project is to provide a way of fighting against such crimes and such situations which restricts our loved ones from reaching us. The project

aims at finding a way to work against these social problems through technology. The growing crime rates should not hinder anyone's mobility and to provide the assurance of safety and protection, such devices are a need of the hour so that no one would need to stop their purpose of life for the fear of unknown.

The combination of hardware (device) and software (Android OS) used in the project helps us to exploit the features of the smart phones in an efficient way. The hardware device is a wearable band that can provide easy accessibility during any emergency. The wearability helps in ensuring that the device stays with the user at all times and helps in reaching it at least possible time interval.

The organization of this document is as follows. In Section 2 (**Methodology**), it gives a detailed overview about the different operations that are performed by the system and provides the explanation for the same.

In Section 3 (**Result and Analysis**), presents research findings and analysis of those findings. This section also provides the limitations for some applications. In Section 4(**Conclusion**) a conclusion is provided to provide a closure about the project and discuss its future developments.

## II. METHODS AND MATERIAL

The USER INTERFACE is the wearable hardware device. So the device is the connecting link between the physical situation and the smart phone.

The components present on the band are: “push to off” button, a BLE (bluetooth) module, a microcontroller board, batteries and a voltage regulator. The wearable device has a PUSH BUTTON that will trigger the process and initiate the working of the software application that is present in the smart phone.

The smart phone is taken into consideration as today’s world is on the verge of the biggest technological revolution and a smart phone is one of the basic possessions of today’s urban population. So the resource at hand, the smart phone, is taken as an integral part of the project and its features are exploited for the successful completion of the project.

A Bluetooth connection will already be established between the mobile and the device. The BLE module will be configured and paired with the mobile Bluetooth and the connection will remain so for the immediate processing. By default, it is considered that the user connects the mobile bluetooth and the device and the connection is maintained at all times.

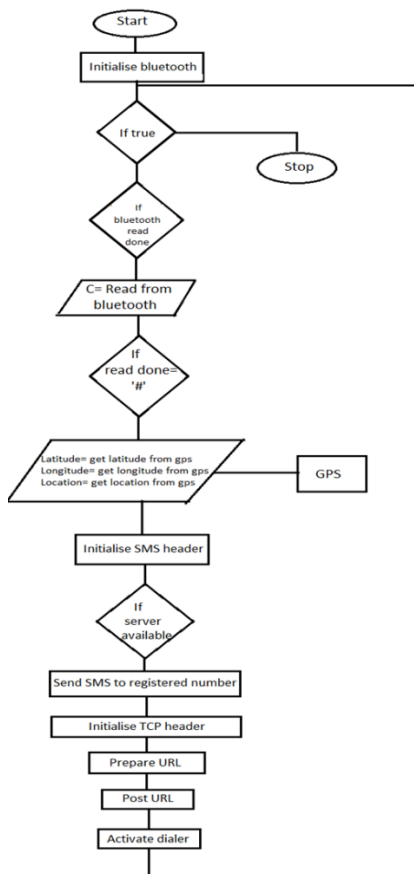
The Push Button will trigger the action of the mobile application that will have the inbuilt functioning of sending help message and location to the saved specific number that will be given as an input to the application. These numbers can be easily updated by the user through the application interface. So, in case of intercity travel, one can carry the

device and update the numbers. The GPS and GSM system of the mobile is used for sending messages to three saved numbers and to give a call to the first priority number. The distress message also contains the latitude, longitude and current address of the user. It will have the Google map link. Sound recorder will be activated simultaneously for the recording of all the physical situation. As sound is omnidirectional so we can use it as an evidence for the physical situation.

The recorded location along with all the above-mentioned information will be stored in the database which can be accessed later. The dumping of the information into the server helps use to keep a track of the number of times the button was pushed and helps us in storing the information even if the device is destroyed.

The whole process of sending messages with location, calling, recording and information dumping will all happen simultaneously according to the designed codes and will occur with a single push of a button. The smart phone need not be taken out for any of the above applications. So with a single push of a button we can access the mobile without taking it out of our bags or pockets.

The use of mobile in the project reduces the size and weight of the wearable device as no extra GPS/GSM module has to be installed into the device. That also makes it cost effective. These emergency numbers will receive the messages automatically as soon as the triggering occurs. It is a single trigger device.



**Figure 1:** Flow chart showing the working of the whole system

### III. RESULTS AND DISCUSSION

The device will send messages and place phone calls to the relatives and friends whose phone number has

been previously given, after pressing the button on the device. The receiver can also track the location of the person with the help of the GPS which is already present in the android phones by giving access to locations. The first phase of the project included connection of Bluetooth module, HC- 05 to the mobile. The second phase consists of sending of location messages to the concerned number, low battery indication and updating of phone numbers according to the location of the victim, all triggered by the pressing of a push button.

Live location tracking could not be done because this feature is available in the mobile phone through Google maps. Google maps provides this feature but it can only be accessed manually. The aim of the project is to trigger all activities with a single press of a push button on the device and not manually using the phone, which will take a lot of time and is also not feasible in case of emergency. Therefore, sending of latitude, longitude and the exact location has been done but not live location tracking as the mobile has to be taken out for accessing the Google map feature. If it can be done automatically by setting permissions somehow, then live location tracking can be achieved.

**Table 1 :** Tabular explanation of result analysis

<b>Objectives</b>	Interfacing of pro mini, Bluetooth module, push button and Li-Po battery	Sending help and location messages on triggering of push button	Placing phone calls to the target phone numbers	Mobile application including updating of phone numbers	Uploading the latitude, longitude and the current location from the GPS	Live location tracking
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Objectives Achieved	Achieved successfully	Achieved successfully	Achieved successfully	Achieved successfully	Achieved successfully	Not achieved
Obstacles faced while achieving those objectives	No obstacles faced	MIT App inventor software update introduced permissions to access the SMS feature, so some changes had to be done with a lot of research	This feature keeps the mobile system engaged. So, it will be the last operation to be triggered by the push button	Software related problems were faced which required deep understanding of DBMS skills.	New topics and skills from MIT App inventor were researched upon to achieve this.	***

\*\*\*Objectives that could not be achieved:

#### IV. CONCLUSION

The work has the hardware device that connects to the mobile software via bluetooth connection. The device is hence activated and when the push button is pressed an SOS notification is sent along with the latitude, longitude and location of the device user and a distress call is then made to the saved recipient. The device is solely made with the purpose of easy and immediate execution during an emergency situation by sending a distress notification by using the mobile but without physically taking it out from our pockets. So the purpose is to access the mobile with just a push button on a wearable band.

The golden perspective of eradicating these crimes may beam in our eyes time and again but the real challenge lies in genuinely reducing the current victimization of our people. With this project, we

plan to target and help the section of the society who believes in purpose and true independence. This project is an attempt to provide them with a sense of protection and to provide them with a way to tackle emergency situations. The whole project is based on the simultaneous working of the hardware device and the android application. The correlation between the two result in a smart combination that works for the protection of the owner at times of emergency and danger. The combination together is aimed at providing a counter attack to the increasing crimes against women and using technology to provide safety and security. We can find many applications based on modern technology. The aim is to see how these applications can be improved and making it a more sophisticated system to provide more safety and security. IoT (internet of things) is relatively new and fast-developing concept.

The project that has been undertaken has lots of features that overcome the shortcomings of the various models/designs that were proposed previously. Nevertheless, there is still a wide scope of work that can be imbibed on our work.

The model can be used as an alert system for protection of not only women, but elderly people too. It can help people with dementia or Alzheimer's disease by sending an alert system that provides the location of the patient to the designated receiver.

The model can also be adapted as a fitness band when there is a non-emergency situation. It can help track a person's heartbeat rate, temperature, etc and thus help a person assess his health record.

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