

# Survey on Safety Devices Using IoT

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Abstract Traffic congestion is becoming a huge problem, which is arising due to vehicle failure or accidents. Transportation and use of advanced technology has great importance in society and that has made many of our lives much easier. By automatic accident detection and alerting GSM & GPS based technology can be used to overcome these problems. Where as in case of Child and Women there are very few efficient security and safety measures adopted. Now in India the safety for women has become a major issue while travelling. Nowadays women think twice before taking any steps out of their homes, especially in the night time. Hence, this is unfortunately, the sad reality of our country and also due to various crimes like child abuse, rape, dowry deaths, trafficking and many more. At the time of women facing unsecured situations, there is a need to ensure safety while travelling. Hence automatic detection system needs to be established where one can send alert message to the police station or the relatives which detects the current location of the required ones by use of such technologies the women and children can get protection. Mainly in remote areas children use bicycles as means of transport from several years and nowadays, despite due to the large availability of new and faster means, the bicycle users is not decreased. Despite the cyclists find difficult to travel within them and other vehicles find difficult to find them during night time. In case of any emergency situation faced at unknown remote areas the cyclist can send their location to required ones to help them. In this paper, report the survey on the existing mechanism for detecting locations, and sending signals and to collect parameters such as temperature of the human body, heart beat etc. using sensors. With the help of GPS and GSM we can track the location of the child, women or vehicle. Hence, by these we can save the life of person's being injured in various locations by sending a text message using IOT technologies.

**Keywords** — Safety Devices, Women, Children, GSM, GPS, Jacket, IoT.

## I. INTRODUCTION

The Internet of Things (IoT) is being widely used in all areas ranging from transportation, providing safety to human's life to an extent of safeguarding the valuable resources. Internet of Things is an interconnection of various devices that a unique identity or it is an embedded computing device that exist within the Internet infrastructure or the devices that run over an Internet. Typically, IoT offers advanced connectivity of devices, systems, and services that goes beyond machine-to-machine communications (M2M) and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices is implemented nearly in all fields of automation enabling advanced applications like Smart Home, Smart Wearable's, Automation Cars, Smart Cities, Advancement in Agriculture, Healthcare etc.

When we talk about Smart city, which is very needful for every human being because the day starts with transportation. Due to heavy traffic in today's life many

accidents occur. This is because of huge population and more and more people travelling using their own vehicles. In present days the rate of accidents is increasing due to large usage of vehicles like cars, bikes etc because of this reason the accidents are happening more. People are going under risk of accident due to over speed, negligence of traffic rules and regulations. The accident is the most heard word today and for the number of accidents is more due to which citizens are facing huge difficulties and problems. According to Ministry of Road Transport and Highway report 2018, India's more productive population is people aged between 18 to 40 years, 70% of them are involved in road accidents. The reasons behind these huge accidents are due to drunk driving, driving on wrong side, jumping signals, breaking traffic rules, improper road maintenance, etc. Government carried out various measures to reduce the number of accidents. The fine has been increased from 500 to 5000 for crossing speed limit, drunk driving, as per Motor Vehicle Act 2019. Death rate has increased due to accidents and major reason being lack of immediate

treatment. If accident victims are able to communicate they can get immediate treatment without time delay. In last few years crime against women has increased to a greater extent. Women are harassed not only in the evening or night but also during day hours at working place, shopping etc. There are number of women's who have been afraid of strangers for their safety. Around 80% of the women in our country have fear regarding their safety. And also child safety is a very big and unsolved issue in our society. Many of the crimes are left without reported. Each and every day young children are being assaulted and violated. Rape has become one of the major crimes in India. The crime rate is growing steadily since last few decades. India is unsafe country and no proper security and protection is given to women as well as children. Despite in front of eyes many illegal and mysterious things is going on in today's life. While we look through on survey about children kidnapping in last year 2,324 missing children's in India out of these only 1,241 children's has been traced and protected and returned. While 1,083 remains still missing. This means that 46% of children's still needs to be searched, this is happening due to child labour, prostitution, illegal adoption & crime training. Delhi has become a source & transit point of such illegal's. According to National Crime Records Bureau (NCRB) data totally 60,000 children's are missing every year. Then only half of the children's could be able to trace them and save them. We can say that India is home for more than 400 million children's there age ranges from 1 to 18 years and India is considered as one of the country in which youth and children's comprise more than 58% of India population. So we can provide a safety and security device for women as well as for children if they need any help or in case of emergency they can monitor the device and get help from required ones through GSM and GPS technology.

In recent years, riding bicycle is becoming more popular to people. It not only our save energy resources, but also protect the environment from air pollution, noise pollution and it is also helpful to stay healthy. For these advantages, more people prefer riding cycle. In this situation, if a cycle does not mount any indication sign to indicate their instantaneous moving actions to surrounding bikes, vehicles and passengers passing nearby the cyclist, the rider will take a risk of the traffic accident. As a result, it is necessary to mount an indication sign to a cycle to indicate its instantaneous moving actions for reducing the risk of the traffic accident. Unfortunately, a cycle is usually small in size and lightweight so that it is not easy to mount an indication sign, such as a brake sign, a left-turn sign and a right-turn sign, to indicate its instantaneous moving action. In past years ago they were using a Dynamo during night time as a battery for headlights. We can also mount the indicators with the help of dynamo but it can only be used when the continuous pedals are moving so here a disadvantage of using Dynamo. So by using the IOT

technology we can design a jacket so that it will mount an indication signs (left, right & stop) which will majorly help during night time due to low visibility of light. By that usage of bicycles will help to reduce the number of accidents it saves fuel, it reduces the traffic in major cities. Smart Jacket for cyclist will come under one of the part of smart city which is an application of IOT. Similar to accident detection and child and women tracking we can use the GPS technology where in case if the cyclist needs any help or in case of emergency he/she can share the location to preferred contacts. The cyclist jacket comes under safety devices.

## II. RELATED WORK

This paper proposes the system that describes about "IoT based vehicle accident detection and tracking system" using GPS technology. Authors have used Raspberry Pi 3 module. Vibration sensor that senses the obstacle sends the interrupt to Pi module. The GPS will detect the location of the vehicle. If the vehicle has met with an accident the module gives the information. This information will be sent to a mobile number. This message will be delivered to the concerned people via internet present in the circuit [1].

In these paper authors have proposed a smart IoT system that instantly notifies to the PSO [Public Safety Organization] headquarters. If an accident occurs, the exact location that indicates the accident occurrence zone is sent through an SMS that point its geographic coordinates via GPS module. The location is shared to police, ambulance, In addition to these, wherever the accident is happened if any person passing nearby that accident can press the button which is attached on the street lamps in main roads. After pressing the button the notification will be sent to an android mobile to police, ambulance [2].

The authors have used a system that contains a vibration sensor in the vehicle. In case of accident occurred or it is hit to other vehicle or an object, it creates a vibration at that time, the sensor will detect the signal and it sends the message to Arduino. After receiving the message from the sensor it immediately passes the message to GSM modem. A reset button is used in case the accident is normal the driver can press a button at that time the message will not be sent. If the driver cannot able to press the button means that is really a major accident then the system automatically sends the message to family members that consists of the current location where the accident had taken place. To inform others they have used the buzzer to produce a beep sound when the accident occurs so they can get the help through nearby people [3].

The authors have proposed a system for accident detection and rescue management. The message will be not sent to the rescue team, if the vehicle is in normal. The temperature level of the driver will be monitored every time by the

sensor, if the level of temperature reaches the threshold then automatically the message will be sent. If the accident occurs the MEMS sensor, tilt sensor and fire sensor detects the condition according to and take the particular actions. The controller will get the input from these above sensors and sends the alert message to rescue team through Wi-Fi and GPS which can detect the location of the vehicle. And it also make connectivity to the nearest hospital so that injured person can get the help through IoT technology [4].

It deals with accident alerting and location detection system. The system uses Arduino that helps in sending the message to different devices in the system. The vibration sensor will be activated when the accident occurs and the alert message will be sent to the registered mobile number through GSM. Using GPS technology they can track the exact area where the accident took place [5].

Work presented in this paper demonstrates Smart IoT device for child safety. It helps the parents for tracking, to locate and monitor their children. If any abnormal values are read by the sensor then an SMS is sent to the parents mobile and also an MMS indicating an image captured by serial camera [6].

In this system authors they have developed an women self security smart band to provide a security for women where she can protect and take help of others. The system consists of temperature sensor and heart beat sensor. Where the temperature sensor keeps monitoring women's body temperature and sends the generated analog data to the controller. The heart beat sensor senses the flow of blood volume that can be decided by the heart pulse rate and sends the location of the women through GPS and GSM technology [7].

The authors have proposed a system for women safety application where the user has to install the application and then has to register. Once done with registration user can login using user id and password. The user will have various options like chatting, sharing of audio and video files also group sharing is available. In case if the women fell that she is unsafe or she get into some trouble she can press a panic button in the application so that she can get help from anyone, User can share images as well as live video capturing to family members so they can take required measures to help her [8].

This paper discusses the concept of a Smart Wearable device for little children. It can be used on any cell phone and doesn't require an expensive smart phone. The purpose of this device is to help the parents to locate their child with ease. Wi-Fi and Bluetooth appear to be an unreliable medium of communication between child and parent. Therefore, the main focus is towards is an SMS text sent through communication medium between child's wearable and the parent using GSM mobile communication. The

parent can see the current status of their child by simply sending specific keywords such as "LOCATION", "TEMPERATURE", "SOS", and "BUZZ" to the wearable device. The device will reply back with a text containing the real time, accurate location, temperature of the child using various sensors [9].

The authors have proposed a smart intelligent security system for women that can automatically sense and rescue the victim. The device thus introduced is the integration of multiple devices. The hardware continuously communicates with a smart phone through internet. The application has access to GPS and messaging services which is programmed in such a way that user can share a message to friends or relatives in case of danger situation. If it receives an emergency signal, it can send a help request along with the location coordinates to the police station, relatives and the people in near radius who have installed the application [10].

The authors have proposed a system through which just by pressing a single button the victim can indicate the case of danger situation. In such case GPS tracks the location and sends emergency message using GSM to saved contacts and also a police control room. Also, the audio and video recorder will start to capture the live incident to report to the person for whom an emergency message is sent. Also the pressure sensor is equipped in this system that senses the physical pressure of the women, if the value of the sensor varies the message will be sent to the contacts. A buzzer is also attached in the system wherein case if the device gets activated the buzzer also produces high beep sound at the same time to alert nearby people such that they get help as earlier as possible. This module can be carried by in handbags, purse etc [11].

Here the authors have proposed a system that will help the victims when they are in danger zone. In this paper main focus is on the women safety. An Electronic based Jacket is proposed that can help to protect women and it operate through smart phone. The system operates on the basis of 3 buttons attached to the jacket. First button is used for circuit on/off. Second button enables the GPS, GSM, and Buzzer. Third button is used for shock circuit. It automatically sends the location to three predefined numbers. These three numbers can be of police station, neighbors, and parents or friends since usually we get help from these groups of people. When buzzer is ON shock circuit will also be turned ON which can injure the attacker. This shock circuit module is proposed for self defense purpose. The work presented in this paper not only protects but helps in notifying others about the situation through messaging services. At the same time camera will be on for capturing image and video will be saved in memory card. Hence, it will be helpful for police also in searching the attacker [12].

### III. OUTCOME OF SURVEY

This outcome outlines the survey about available and further improvement on technologies by using existing technology and further improving these technologies in other ways that is being running over Internet of Things. The main issue today all are facing is riding bicycle during night time due to low intensity of light and other vehicles find difficult to point the cyclists and find difficult to complete their journey. We have gone through many IoT safety devices that has been existed using that technological ideas and methodologies we have come through to develop or give an idea to overcome the problem facing by cyclists by proving a wearer jacket during night time. In addition we can use the GPS technology to trace or locate the present location of the cyclists if they need any help. In all above referred papers we have saw that GPS and GSM modules are mainly used for the purpose safety for women and children so here we are using the same technology to build a cyclist jacket through Android application. The major purpose of this paper is to deal with cyclist jacket (safety device) to overcome future problems. In coming days there will be more importance for riding bicycles due to traffic congestion and cost of fuel.

### IV. CONCLUSION

The main aim of this paper is discuss about available IoT based solutions to problems faced during accident, Kidnapping, night riding difficulties. By using GPS, GSM and various Sensors user can track, locate and share their difficulties by automatic messaging services. Also by installing the applications discussed in section II people can feel safe when they are travelling, particularly while travelling alone. Major work carried out is with respect to providing safety and sending alert messages in case of accidents. In India many children ride bicycles to go to school and mainly workers return late home after finishing their work mainly in urban areas. Hence there is a need for developing a Smart Jacket that can include the indication signs (left turn or right turn) for the Cyclist. Vehicles behind the cyclist will not find it difficult to travel if the cyclists use signals.

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