



WOMEN EMPLOYEE SECURITY IN CORPORATE CABS

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Abstract

Today in the current global scenario, the prime question in every girl's mind, taking into account the ever rising increase of issues on women harassment in recent past, is only about her safety and security. The only thought haunting every girl is when they will be able to move freely on the roads even in odd hours without worrying about their security. The proposed system incorporates a GPS module to track the movements of the cab in which the employee travels. In order to ensure that the driver is not drunk an alcohol sensor is mounted within the system which do not start the cab if the driver fails the test. To keep account of the employees who are using the cab facility, the person entering the cab is verified with their RFID (Radio-Frequency Identification) card. Panic Button is also placed in the cab to ensure the persons security at emergency situations. Once the panic button is pressed the video is captured within the cab and is sent to the admin through the Telegram application. The system is implemented in Raspberry Pi. The system also facilitates to let the admin know if any breakdown occurs, also the case of accident using an accident sensor. The system is also supported with the database where the admin can add, delete or manage the employees accessing the cab. Also the employee is able to view his status and can also submit the leave application. It has a messaging system made using a Twilio account.

Index Terms: RFID card reader, panic button and breakdown button, accident sensor, Telegram, Twilio account.

I. INTRODUCTION

The corporate world is the most competitive

world these days. Each company tries to bring the best out of people. So it is necessary that all employees have to work till late night. The need for a safe travelling system is inevitable especially in case of women employees. An efficient travelling system is difficult as it has to keep track of the employees, get current details about them, get their location and even if they get stuck in traffic also get that information and maintain their security till they get home safely. Till now several systems have been launched but none of them has all features necessary to give proper security for women. Keeping all these in mind we are proposing a system that can provide better security for women travelling in corporate cabs.

Various surveys were conducted regarding the violence happening against women. In Bangladesh 66% of women are being harassed either by their husbands or by some other means. In Kerala too many cases have been registered. All these show that women are not still safe in their houses or in the outside world.

In our project we are using the Global positioning System(GPS) to track the location of the person. The cab has facilities to keep track of who all are using the cab. This is done using an RFID card or the Radio Frequency Identification Card. It can have all the data relating to a particular employee. According to various situations inside the cab there are many security systems provided. It has an alcohol sensor to detect whether the driver is drunk or not. A button called as panic button is used in case of panic situations. Accident detection using a Piezoelectric sensor. Breakdown detection system is also provided. The current status of the person is send to an admin monitoring the system through a Telegram application. All these are

controlled by Raspberry Pi.

The main idea of developing such a security system is that it should provide a complete security wherever a woman goes in the cab. Also it should overcome the disadvantages existing in current systems.

II. RELATED WORK

Some of the closely related works for our project have been discussed in this section. We have come across several systems that perform the same functionalities of our system. The main aim was to find out how these systems work how to overcome their insufficiencies and methods to improve them.

Authors in [1] proposed a system with the following features. It has a security device that is connected with the android application and a Bluetooth security device. The security signal is processed by the mobile application. Using GPS they will get the location of the person and in case of emergency they will send message to all the contacts along with the location. One feature is that the message is send to nearest police station also. All the features occur automatically without opening any of the applications. The distance between the mobile application and the security device is considered as it affects the performance of the system. The system will give an efficient result if the distance is 10m. Beyond that the system does not recognize the signal.

In “Abhaya”: An Android app for the safety of Women”[2] published in IEEE Journal in 2015, almost the same features are used. First of all we need to enter the contact numbers of friends, relatives and police station and save it in the system. When in use we have to click the start button. Once the start button is pressed the message to contacts as well as the location of the victim will be send. The sending of location will continue until the stop button is pressed. All the information will be stored in the system. The system has a rescue button provided which sends the GPS location as co-ordinates or URL, so that it can be connected too Google map and correct way can be found. A time interval of 5 minutes is set in the system. This is provided so that message is send every 5 minutes until stop button is pressed. Continuous tracking is done here. If the other person is in a call during the incident, after the call also he/she can view the message and get the location.

In “Smart Security System for women based on Internet of Things” [3] published in IEEE Journal in 2016, which describes a system implementation that uses the latest IOT technology. The key feature of this system is that along with the tracking of location the health condition of the person can be monitored. For that various gadgets are provided like GPS receiver, temperature sensor, GSM, pulse rate sensor. Such a system will be helpful as it can provide medical help to the person if needed. It has a Smart Band attached with smart phone which helps to reduce size and cost. Smart phone is connected with the smart band using a Bluetooth Low energy. It acts as an interface between the user and the device. The Smart band receives all information regarding the health condition of person. Like the previous apps this app also sends messages to police station and nearby contacts. All those who have the app installed can get the messages through internet facility. Control unit controls smart band and GPS receiver. The Pulse rate sensor used in this calculates the Heartbeat of the person. GSM module sends data from control unit to the base unit. Temperature sensor measures body temperature. GPS tracks latitude and longitude. In “Play it Safe: A Personal Security Application on Android Platform”, [4] there is a mobile application, Android platform, personal security and an SOS application. SOS is used to use application without unlocking the device. This system also has facility to send messages as well as location. Assistance is provided as fast as possible. It has features for everyday safety and emergency. There is facility to send broadcast notification as well as photos asking for help. It has an alarm that makes sound in case of attack. There is fake call system. Users can make fake call to themselves. They can also set the name and time of the fake call. The proposed system [4] published in IEEE conference held in 2016 describes about a system for woman and child security. It is a system that helps track of harassments happening in current world against women and child. It uses a combination of GPS and GSM module. This system is very portable. It uses a smart messaging system(SMS). Mobile phone and internet facility is a must here. There is a SIM card GPS receiver and UART microcontroller. Help is initiated using a pushbutton and microcontroller is activated. Latitude as well as

longitude is found out. UART sends message to GSM module along with Google map. This is useful since it can be carried anywhere and no third party interference.

In "Prototype of an Intelligent System based on RFID and GPS Technologies for Women Safety" [5] published in IEEE Journal in 2016, is a system for women security made using RFID and GPS. The scanned information using RFID is scanned and the information is stored in AT89C52 microcontroller. The controller sends information to GSM module. In some cases the culprit may throw away the bag with phone. In these situations we can use this system efficiently as it has RFID tag embedded in watch. There are two types of tags known as the active and passive tags. Active tags are battery operated and it also has encoded data in it. There are 4 relays connected with the RFID reader, GSM, GPS and MAX232. Transfer of signals and communication takes place through relays. An ON/OFF switch is provided for RFID cards.

III. SYSTEM OVERVIEW

In system overview we are discussing about the block diagram and working of the system. Here we can see in the block diagram that all operations are controlled by Raspberry Pi unit. The system works in the following manner. There is an RFID card which is used to swipe and detect the authentication of the user. The RFID contains registered users. This is swiped by the driver as well as the employee. Next the alcohol content of driver is checked. If the driver is drunk means a green light will glow on the sensor. Then the vehicle will not start. If he is normal means the vehicle will start. Now there are some buttons provided in the cab in case of emergency situations. The panic button provided is used to press in case of any panic situations or attacks. Once the panic button is pressed the camera in the cab will be activated and start recording the video. The video is send to a person monitoring the cab through a Telegram application. This is similar to a chat app with additional functionalities such updation of data leave application, video and message sending. Messages are also send to various contacts through the Twilio account created by the user. When the breakdown button is pressed message will be immediately send. A piezoelectric sensor is placed to detect accidents.

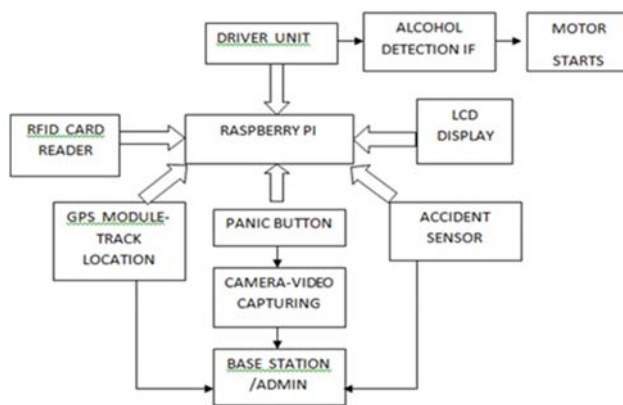


Fig 1. Block Diagram

IV. SYSTEM DESIGN

In system design we are going to discuss the various modules used for the design of the system. The system has mainly two units cab unit and the company unit. Customer and driver related interactions will be incorporated with the Cab unit module and the cab evaluation along with monitoring is done with the Company unit.

A. CAB UNIT

The cab unit that has been installed within the car would ensure to provide the security services for women employee. It tracks taxi movement, updates taxi's location through the GPS module and enables taxi driver to get into the cab only if the driver is passed with the alcohol detection test. The mobile sniffing system that automatically disconnects the phone call of the driver in few seconds is also incorporated with the cab unit. The mobile application with the customer captures the video at the panic situations and the emergency call is send to the phone numbers registered in prior. The Main server provides an android application for customers. The android application stores the information into the main server that records the details of the employee using the cab.

B. Company unit

The company unit has its physical existence within the company itself which can control and coordinate the cab. The information like tracking taxi movements, updates taxi's location and capturing and sending of the video at the panic situations are obtained and monitored at the company unit. Third part, the Main Server provides a way to integrate these two modules. A main server coordinates the communication between these two components and merges them into a complete and unique system. Main server

collects and handles the data received from customers' application. The company unit is monitored to obtain the details and updations of the employee that using the cab from the details being sent from the cab unit through the GSM module.

IV. IMPLEMENTATION

These are the hardware components used for implementation

Hardware description

A. Raspberry Pi

The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and in developing countries. The original model became far more popular than anticipated, selling outside its target market for uses such as robotics. It does not include peripherals (such as keyboards, mice and cases). However, some accessories have been included in several official and unofficial bundles. According to the Raspberry Pi Foundation, over 5 million Raspberry Pi were sold by February 2015, making it the best-selling British computer.



Fig 2. Raspberry Pi

B. Alcohol Sensor

This kind of sensor is used to check the alcohol content through breathing. This sensor is placed near the steering of the vehicle. The feature of this sensor is that it has high sensitivity and response time and alcohol content is detected through analog signals. The driver has to breathe through a hole provided. If the driver has alcohol content in him the vehicle will not get started. The result is checked by the controller and does not allow the engine to start the vehicle. It is connected to one of the pins of Raspberry Pi.

C. Radio Frequency Identification (RFID) card.

Radio-Frequency Identification is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags. It uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Passive tags

collect energy from a nearby RFID reader and interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC). This information the driver can select the parking space which is free according to his wish. This information obtained from the sensors is then sending to the controller.



Fig 3. Rfid card

D. Camera

In the system, camera is used that would record a video. Whenever the panic button is pressed, a SMS is sent through the Twilio to Android mobile also telegram message send to the company module.

E. Twilio

It is a cloud communications platform as a service (PaaS) company based in San Francisco, California. Twilio allows software developers to programmatically make and receive phone calls and send and receive text messages using its web service APIs. Twilio services are accessed over HTTP and are billed based on usage Twilio uses Amazon Web Services to host telephony infrastructure.

F. Global positioning System (GPS)

The global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather, anywhere on or near the Earth, where there is an unobstructed line of sight to four or more GPS satellites.

G. Liquid Crystal Display

Frequently, a microcontroller program must interact with the outside world using input and output devices that communicate directly with a human being.



Fig 4.Liquid crystal display

H. Stepper Motor

A Stepper Motor or a step motor is a brushless, synchronous motor which divides a full rotation into a number of steps. It controls the locking and unlocking of the door all time.



Fig 5.Stepper Motor

I. Relay

To control the ignition of the vehicle from the controller inputs, a SPDT (Single Pole Double Throw) relay is connected to the vehicle power input.

J. Push Button

A push-button is a switch mechanism for controlling some aspect of a machine or a process.

Software Description

a) Telegram

It is an application that provides instant messaging service. Telegram client apps are currently available for Android, iOS, Windows Phone, Windows NT, MacOS and Linux. User can send messages and exchange photos, videos, stickers, audio and files of any type. Its client-side code is open-source software but the source code for recent versions is not always immediately published, whereas its server-side code is closed-source and proprietary. The service also provides APIs to independent developers. Telegram accounts are tied to telephone numbers and are verified by SMS or phone call. Users can add multiple devices to their account and receive messages on each one.

b) Python 2.0

It is an interpreted high-level programming language for general-purpose programming. Created by Guido van Rossum and first released in 1991, Python has a design philosophy that emphasizes code readability, and a syntax that allows programmers to express

concepts in fewer lines of code, notably using significant whitespace. It provides constructs that enable clear programming on both small and large scales.

V. RESULT AND CONCLUSION

In this paper, we have described “A solution for women travelling in corporate cabs” for the safety of women. This application helps in live tracking of the location of victim through GPS, Camera RFID card and other devices. It also uses high range hardware and software devices to make the system. It also makes use of phone contacts to get assistance from others and also to send messages to relatives. The person monitoring the system can get the exact things happening in the cab. The main advantage of this is that the location of the cab can be traced easily from anywhere. As future enhancement we can this application can be integrated with law enforcement database which includes the databases of all the regional cops. Also it can be developed for IOS and Windows platforms. Thus our application can be very useful for ensuring maximum security with variety of features.

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