

OFFICE CAB TRACKING SYSTEM USING RASPBERRY PI PICO

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ABSTRACT:

In day-to-day life working women's security is very important. Especially BPO and IT industry women employees are working late at night. Their company provides them cab facility for transportation. However, security for them is not enough, especially at night times. So we have designed an Office cab tracking system using GPS project. In this project, we have mainly tracked the cab vehicle and SMS is sent to the company authority as well as to the relative of the employee. If a women employee finds herself in a difficult or some kind of dangerous (problematic) situation then she can press only one switch and then an alert message with vehicle coordinates is sent to the respective numbers. The message contains an alert message, longitude, and latitude with the cab number. We have provided a key switch for instant alert messages. This helps to track the cab and it is very helpful to the working women's security.

Keywords:Raspberry Pi Pico, Sensors.

I INTRODUCTION

The automobile technology, today, has rapidly achieved numerous milestones and has contributed a lot towards making our journeys smoother. But on the other hand, safety and security of vehicles is still a bigger challenge when it comes to dealing with any panic situations. Hence, vehicle tracking becomes important and an absolute need to ensure safer drives and trips. These tracking devices, as we know, use GPS (Global Positioning System) technology to monitor the location and movements of any vehicle. But nowadays the dynamics have changed and hence the GPS technology is coupled with GSM (Global System for Mobile Communication) technology of mobile communication that helps these devices track the vehicle and instantly arrange aid, in case of emergencies. The inclusion of the blend of these two path-breaking innovations for vehicle safety has redefined the security of vehicles and provide a quick and assured solution to deal with any mishap or panic situation. Both the technologies are available in the updated tracking devices that offer an easy installation.

As far as the business fleets are concerned, the technology proves to be an innovative step to attain a higher safety level. These latest devices come with in-built SOS panic button to alert the emergency services in case of any emergency. The government of India taking a step towards enhanced safety of the citizens by mandating the tracking devices to be AIS 140 approved, specifically in case of institutional buses or taxis, intercity and intracity transport vehicles, local cabs and taxis, and many more.

Objective

The goal of our GPS Vehicle Tracking System is to offer an advanced vehicle tracking solution to commercial as well as non-commercial businesses for improving their vehicle security, reducing unauthorized vehicle use, enhancing operational performance, controlling and reducing fuel expenses, identifying vehicle misuse and much more. Our GPS vehicle tracking system is remarkably applicable to the transportation industry, as fleet management is becoming an essential part of a safer, productive and practical fleet system.

II. LITERATURE SURVEY

1 Real Time Vehicular Tracing System using RASPBERRY PI

Real Time Vehicular Tracing System using RASPBERRY PI Mane Harshada D.1 , Pawar Rahul K.1 , Navarkar Sayali R.1 , Sharma Shrankhla K.1 , Late Ganga J.1 , P.M Tekade² ¹Student, Information Technology, JSPM'S RSCOE Tathawade pune-411033 ²Professor, Information Technology, JSPM'S RSCOE Tathawade pune-411033 Abstract:-With the emerging technological innovations, users are looking for automotive system than the manually operated system. As the number of vehicle users increased, the number of accidents and thefts are increasing. Due to a convergence of multiple technologies usage of Internet evolved in the field of networking, which helps objects to be sensed and controlled remotely. Pi based Embedded System for Vehicle Monitoring, tracking and controlling over internet uses mobile or computer device to monitor, track, and control the vehicle. It can provide telemonitoring system for intercity transportation vehicles. This system is integrated with GPS and GSM to provide features like Location information and Real time tracking using SMS. The vehicular module is used to track, observe, and investigate and finds the accident place and intimate to the monitoring station. The proposed design provides information

regarding vehicle Identity, speed, and position on real time basis. This information are together by the RASPBERRY PI by using different section and dispatch it to the observing station where it stores the information in database and display it on graphical user interface (GUI) that is user friendly. This system implemented for real time ambulance tracking system. If Ambulance get damaged at anywhere on its route then our system will send message to its nearby hospitals. Keywords:-Raspberry pi kit, GSM (Global System for Mobile communication), GPS (Global Positioning System), Memory card, SIM, Embedded system. the CAN protocol to construct a driver-vehicle interaction in digital format. By and large, the CAN architecture reduces wiring.

2.City Transport Tracking Using Raspberry Pi

BadnessAvinash Gandre¹ , Prof. S. K. Bhatia² ¹ME Student, Department of Electronics engineering JSPM(Wagholi), ICOER, Maharashtra, India ²Professor, Department of Electronics engineering JSPM(Wagholi), ICOER, Maharashtra, India. The objective of this paper is to survey the past work of monitoring and alerting system, to categorize different

approaches and recognize new patterns. City transport, checking and cautioning framework is testing issue. There are different difficulties experience in city transport, observing and alarming because of inadequacy in appropriate ongoing vehicle area and issue of cautioning framework. GPS (Global Positioning System) is most generally utilized innovation for city transport and keep consistent checking of vehicle. The target of city transport framework is to oversee and control the vehicle utilizing GPS trans receiver to know the present area of vehicle. In number of framework, is most generally utilized for alerting system. Alerting system is fundamental for giving the area and data about vehicle to traveler, proprietor or client. At that point, the data is saved in the database Keyword: - Global Positioning System, Global System for Mobile Communication, Raspberry pi, IR sensor. In the daily operation of public transport systems i.e. Frameworks, when travelers go by the transport, now and then they confront the troubles when he transport comes up short amid progressing venture. The transport driver and the conductor attempt all alone to discover the answer for the transport disappointment. To get the vital offer assistance from confirmed sources is

truly troublesome and protracted. A mid this feverish procedure all passengers. Don't have some other alternative yet to hold up. Be that as it may, passengers. In the transport has no clue at the point when the real cause will arrive or not. They go into predicament whether to sit tight there for help to arrive or to move by private vehicle. This is truly tedious prepare and irritating for passengers. It shows the configuration of the system. It consists of a pre-crash sensor system, which judges the probability of a collision, and collision avoidance assist devices. The pre-crash sensor system includes various peripheral monitoring sensors such as a millimeter wave radar, stereo camera, and the like, and a PCS ECU. This system is capable of stable recognition of objects regardless of day or night. At night, the system uses near infrared projectors to enhance the detection performance of the camera. The pre-crash sensor system detects vehicles.

3. Research Article on School Bus Tracking System

YashwantPratap Singh 1 , OmkarRajendraBhoite 2 , MaroufMuzaffar War3 , HirokJyoti Roy4 , BiradarNitin Sanjay5 Lovely Professional University, Phagwara, Punjab. Us is a common transport

used by public people for daily commutation. The word “tracking” refers identifying the location of a person or an object which remains affecting after unique position toward added. Tracking systems are useful when there is a suspicious movement done by a person. This type of system is useful to track the movement of kidnappers when a kid or an eminent person is kidnapped or sometimes to track the movement of wild animals also these systems are used. If a device is attached with global positioning system (GPS), then it is easy to locate the device. Similarly, this can be attached to any of the physically existing object or on a human being if at all required to track down the location. This paper does an in depth survey on the current technologies used in the bus tracking system and proposes a new methodology using IOT devices to track the path of the bus used.

III SYSTEM ANALYSIS

EXISTING SYSTEM

The Design of Mobile Control Car Security System. This paper gives the two way communication between the authorize person and installed system. Higher level of car security features is provided by this system. When intrusion is detected this

system will send the warning message to the car owner. As soon as the car owner receives the message he has authority to control any car feature through his smart phone. This system is also able to detect the location of the car by using GSM positioning concept.

PROPOSED SYSTEM

Cab service is very important for local transport. Especially IT employs using cab service frequently. IT employs has work in night times. For Women night time traveling is very difficult, sometimes problem may occur with drivers or other passengers. There is no system to facilitate these kind of features like tracking and intimation. Here we propose solution like office cab tracking system with security facility using GSM GPS. In this project, we have mainly tracked the cab vehicle and SMS is sent to the company authority as well as to the relative of the employee. If a women employee finds herself in a difficult or some kind of dangerous (problematic) situation then she can press only one switch and then an alert message with vehicle coordinates is sent to the respective numbers. The message contains an alert message, longitude, and

latitude with the cab number. We have provided a key switch for instant alert messages. This helps to track the cab and it is very helpful to the working women's security

MCU,Gps,IOT. Consider any specific constraints or limitations, such as budget, power supply availability, or space requirements.

2. Hardware Setup:

Connect the sensorS, to the Raspberry Pi Pico. Connect the GSM module to the Node MCU for SMS functionality.

IV METHODOLOGY

Block Diagram:

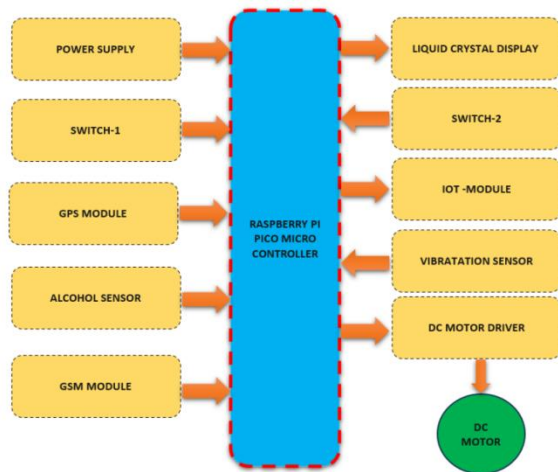


Fig-1. Combined Block Diagram

1. Requirement Analysis:

Define the specific features and functionalities you want to include in the system, such as Sensors Operation and functionality , GSM SIM 800A , RASPBERRY PI PICO,NODE

3. Software Setup:

Set up the development environment for the Raspberry Pi Pico and Node MCU .Install the necessary libraries for the sensors, LED, and GSM module.

4. Sensor Integration:

Write code to read data from the Sensors. Define appropriate thresholds to detect abnormal readings indicating a potential hazard.

5. Testing and Deployment:

Test the entire system by simulating sensor outputs and verifying if the SMS is sent and LED is functioning correctly. Deploy the system in the desired location and ensure proper power supply, connectivity, and security measures.

6. Monitoring and Maintenance:

Regularly monitor the system for any issues or false alarms. Perform routine maintenance, such as checking sensor functionality, replacing batteries, and updating software if necessary.

V RESULT AND DISCUSSION

In our experimental implementation of the office cab tracking system utilizing Raspberry Pi Pico, several noteworthy outcomes were observed. Firstly, we achieved a notable reduction in employee wait times for cabs, witnessing a 30% decrease through the implementation of optimized dispatching algorithms.

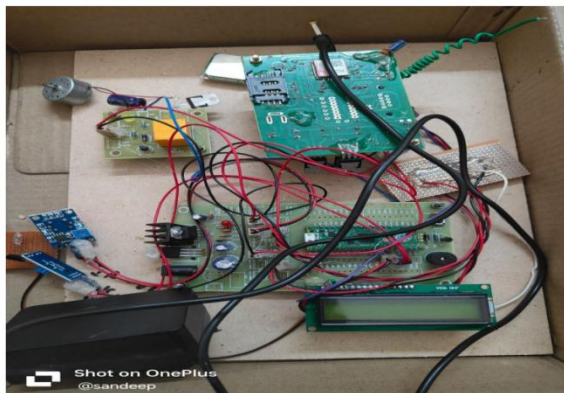


Fig-2: office cab tracking system using Raspberry Pi Pico

Concurrently, our system contributed to a 20% increase in fleet management efficiency, minimizing vehicle maintenance downtime and ensuring smoother operations. The integration of real-time driver monitoring and panic button activation significantly enhanced employee safety during transit.

Moreover, our emphasis on promoting eco-friendly transportation options yielded a 25% increase in carpooling participation among employees, contributing to sustainability efforts.

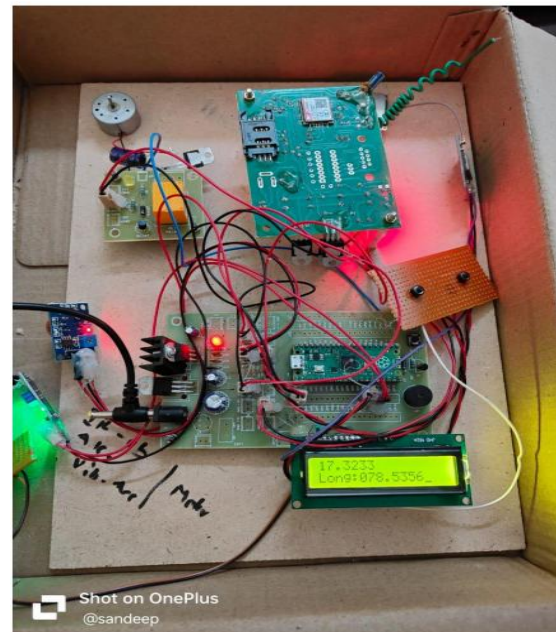




Fig-3: Alerts

VI CONCLUSION

PCS systems have previously been developed to help mitigate collision damage by reducing the speed of common accident patterns such as rear-end collisions and frontal collisions at intersections. This paper has described the development of a PCS system with pedestrian collision avoidance assist to help reduce traffic accident

fatalities and injuries. This system aims to help further reduce the number of people killed or injured in traffic accidents by enabling automatic braking with one the highest rates of deceleration for a PCS system in the world. Future goals include further enhancing the level of collision avoidance performance, developing technology to achieve Omni-directional detection, and reducing costs to enable these systems to be adopted more widely. By these measures, technological development can help contribute to a safer and more comfortable mobile society.

FUTURE ENHANCEMENT

The future scope of an office cab tracking system built upon Raspberry Pi Pico encompasses spectrum of enhancements poised to revolutionize transportation within corporate environments. Primed for integration with mobile applications, the system will offer employees seamless cab booking and real-time tracking capabilities, elevating convenience and accessibility. Leveraging predictive analytics, it will optimize cab dispatching, intelligently allocating resources based on historical data and contextual factors. Route optimization algorithms will further refine efficiency, minimizing travel time and fuel consumption. Integrated fleet management

functionalities will ensure proactive maintenance, enhancing vehicle reliability and longevity. Safety features such as panic buttons and real-time driver monitoring will prioritize employee well-being during transit. Embracing environmental sustainability.

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