Design of Bus Tracking System using GPS and Q-R Code attendance System

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Abstract— **Time and patience are needed while using public transit. Despite the governments rigorous measures aimed at ensuring the safety of children, crimes against children are on the rise. In today's world, transportation plays an extremely important role in daily life. Android is becoming very popular because the source code is completely free also, Android is highly suitable for expansion as the developer see fit, so building a mobile application for Android devices is very common these days due to the mentioned reasons.. This paper proposes a system that is based on a QR code, which is being displayed for students during or at the beginning of each lecture. Using smartphones to speed up the process of taking attendance would save lecturing time and hence enhance the educational process. The proposed system also takes care of preventing unauthorized attendance registration using multi-factor authentication Using punch cards, log books, fingerprint systems, barcodes, QR codes, and RFID, among the various types of attendance systems that have been developed. On the other hand we have GPS tracking system in which the capacity to locate moving cars using the Global Positioning System is one of the primary contributions of Information Technology (IT) to traffic data collection (GPS). This paper presents a system to monitor pick-up/drop-off of school children to enhance the safety of children during the daily transportation from and to school. The system will be designed to monitor children ridership in a safe and non-intrusive way. As every student wants to know the exact location of the bus so this paper gives the real-time updates about the bus and also gives the exact location on the Google map. This initiative is the result of a study of technology for improving the safety of school children's transportation. This study proposes a solution that uses current technologies to ensure complete safety for schoolchildren at a minimal cost.**

Keywords—GPS Module, Q-R attendance, School Bus Safety

I.INTRODUCTION

There are many cities in India where the demand has overcome the road capacity and thus further increased the congestion and delay in the travel time [1]. As the more use of road transport it increase the vehicle population. India has experiencing tremendous growth of vehicle population an average growth rate of 9% per year in country [2]. As the project mainly depends on safety of school children The system is designed to monitor children ridership in a safe and non-intrusive way. It will use a combination of RFID, GPS (Global Positioning System), and GPRS (General Packet Radio Service) technologies. As the student's tag is detected by the reader installed in the school bus upon entering or leaving the bus, the time, date and location is logged and transmitted to a secure database [3]. This will let the driver to know the number of students inside the bus and the students who departed from the bus. Moreover, the system has an emergency system that will alert in case if there is a child inside the bus after the bus stops at the destination by sending an SMS to the school management via GSM modem [4]. And with this the the new technology is taken with same RFID tag or by Bar code or Q-R code the attendance management can be done taking student's attendance during each class is a time consuming process especially when classes are big so the proposed solution offers a QR code for the students to scan it via a specific smartphone application. The code along with the student identity taken by the application will confirm the students' attendance. It will speed up the process of taking attendance and leave much time for the lecture to be given properly. The proposed system also takes care of preventing unauthorized attendance registration using multi-factor authentication. That is, it considers "Something you know", "Something you have", and "Something you are" to confirm the student identity [5]

II LITERATURE REVIEW

A literature review has showed there are many studies introduced in a system. As the traffic has become main reason for development of delay in travel time or congestion, by this study we can get an analysis about the travel time delay. To overcome this threaten of heavy congestion and travel time delay, analysis was carried out by **Fida Anjum et.al[1]** in this study they considered 5 different places and analysis were carried out of Pulwama town by the help of questionnaire survey, stopwatch method and observational survey . The road was majorly being used by cars, small buses, goods vehicles, motorcycles. The analysis was carried out on the average daily traffic from both sides on the selected stretch for the selected five different locations from 7am to 7pm and found that at peak hours of morning and evening the traffic congestion is high. By another research by **N. I. Prajapati et.al [2]**To study the traffic characteristics on road network there is a need to study the existing traffic conditions. For that the traffic surveys are carried out on selected stretches of Kalupuar area of Ahmedabad city Traffic volume count carried out at Kalupur area Ahmedabad during morning peak (8am to 12pm) and evening peak (1pm to 8pm) for the determination of congestion spot. Another research is done **by Shailesh Ghanekar et.al[3].** This study gives the idea about monitoring and tracking school children when boarding and leaving the bus. In this project an arduino plays an important role where it send or receive the signals, messages. As the student's tag is detected by the reader installed in the school

bus upon entering or leaving the bus, the time, date and location is logged and transmitted to a secure database. This project tested the applicability of Radio Frequency Identification (RFID) in tracking and monitoring passengers during their trip to and from their workplace. **Maryam Said Al-Ismaili et.al[4]**. This project intense to develop a bus safety system that will control the entry and exit of the student from the buses through an energy efficient methodology using GSM technology connected to Arduino which provides tracking system of school bus in safer manner. The paper proposed a bus safety system which was designed to control the entering/exiting of students from the bus. This system does several tasks, including identifying personal information (Eg. Name) of each student using RFID tag, which will exchange the data with the RFID reader via radio waves, and displaying each student name into LCD display. **Fadi Masalha et.al[5]** The system lies between online learning and traditional learning as a facilitation for the attendance record-keeping process, in a way that enriches the lecture time so that it can better be utilized in giving useful materials rather than wasting the time taking attendance. The system requires a simple login process by the class instructor through its Server Module to generate an encrypted QR code with specific information. The students can then scan the displayed QR code using the system Mobile Module, provided to them through the smartphone market by the university. Along with the student's facial image captured by the mobile application at the time of the scan, the Mobile Module will then communicate the information collected to the Server Module to confirm attendance. So this can be new development towards the new attendance system.

III PROPOSED SYSTEM

The study examines the issues related to school trips like safety, comfort, routes & schedules. The number of trips for education and employment is increasing. This will inevitably lead to road congestion. The current transportation systems are not sustainable in nature. which will be analyzed to improve by introducing GPS And considering new technology Q-R code attendance system implementation. The project aims to improve the accessibility and safety features of school/college transport system.

SMART ATTENDANCE SYSTEM

The conventional method allowing access to students inside a college/educational campus is by showing photo i-cards to security guard is very time consuming and insecure hence inefficient radio smart attendance system is one of the solution to address this problem, this system can be used to allow students in school, college and university. It also can be used to take attendance of workers in working place its uniquely identify each person based on the different types of smart concepts make the process of allowing security access easier tasks and secure. Students or worker only need to place their i-card, RFID tag, QR code, face recognition or fingerprint in front of sensor or reader and they will be allowed to enter the campus and if any invalid person is shown then attendance is not recorded then it gets failure to authenticate. As the different types of attendance system we have adopted the QR code attendance system is taken into consideration.
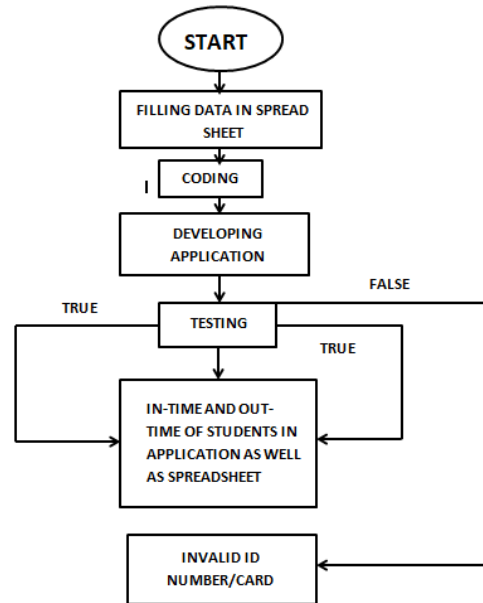

Fig No 1

As the flowchart explains the smart attendance system firstly the data is collected from the students and this data can be used as the related data sheet can prepared. A QR code, is read by an imaging device, such as a camera, and formatted algorithmically by underlying software using Reed-Solomon error correction until the image can be appropriately interpreted. Data is then extracted from patterns present in both horizontal and vertical components of the image. Figure shows a sample of an unencrypted QR code that will be needed by the proposed system.
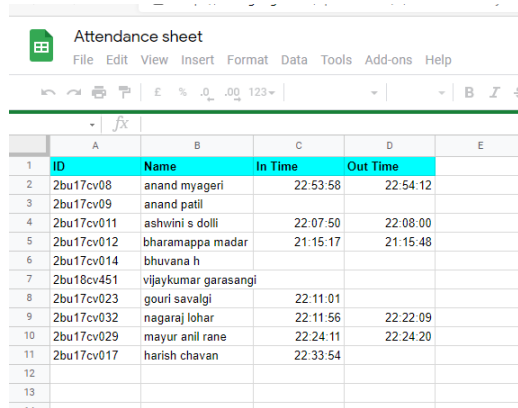

Fig No 2

In this Q-R code the unique code can be embedded in this and the code can be used to record the attendance. The solution bridges the gap between online and traditional learning by facilitating the attendance record-keeping procedure in such a way that the lecture time is better spent on delivering important materials than collecting attendance.

In this system the creating Spread sheet is important to store the data of each students and also Google's spreadsheet is similar to Microsoft's Excel application. While they offer comparable functions, Microsoft Excel and Google Spreadsheet operate in different ways. Microsoft Excel is installed and launched, and it can be used offline. While the Google Spreadsheet is a component of Google's web-based online software, it can only be accessed and modified via the internet. When you want to continuously updating your data

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without having to manually open the Sheet that you're working on, Google Spreadsheet is a terrific tool to use.

While the camera which can detect the Q-R code can be placed in the entry of the college and can record the attendance of each student

Fig No 3

The application scans the Q-R code and the Real time update of the In-Time and Out-Time of the students and the attendance can be updated. Implementing this project in the universities will make recording the attendance digital and simple to manage. Various resources which are used to record the attendance traditionally will be replaced and time will also be saved.

Fig No 3

The application which can be installed in the hardware so that the Q-R code can be recorded .

GPS TRACKING SYSTEM

A GPS tracking unit, often known as a geo tracking unit or just a tracker, is a navigation device that uses the Global Positioning System (GPS) to follow a vehicle, asset, person, or animal's movement and identify its WGS84 UTM geographic position (geo tracking). Locations are kept in the tracking unit or sent to an Internet-connected device via the cellular network(GSM/GPRS or SMS), radio, or satellite modem included in the unit, or Wi-Fi. Various companies purchase position data and track it for marketing purposes.

Also used by the military and criminals to shut down and pick up repossessions and thefts, as well as locate truckloads.

FACTORS AFFECTING TRIP GENERATIONS

Income, vehicle ownership, household structure, and family size are the primary factors that influence personal trip output. At the zonal level, additional considerations such as land value, residential density, and accessibility are taken into account. On the other side, the personal trip attractiveness. Roofed space available for industrial, commercial, and other services, for example, has an impact. Zone employment and accessibility are also employed at the zone level. Freight journeys, in addition to personal trips, are of interest in trip generation modeling. Despite the fact that it accounts for around 20% of all journeys, They provide a considerable impact to traffic congestion. The number of employees, sales, and location of commercial enterprises all influence freight travels.
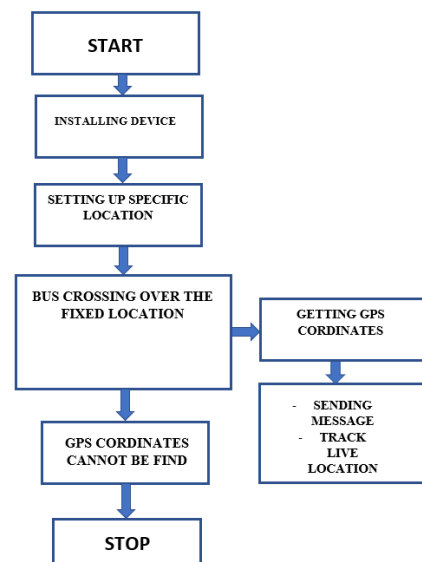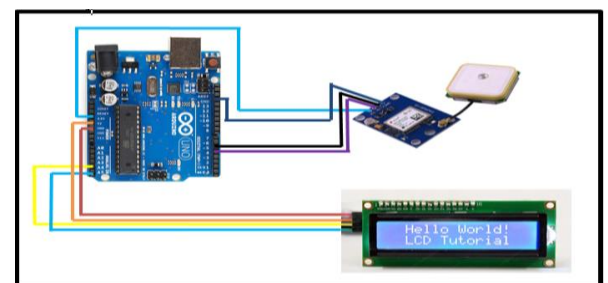

Fig No 4

CIRCUIT DIAGRAM

Fig No 5

CONNECTING GPS NEO 6M TO ARDIUNO

ARDIUNO----------GPS
3.3 V-----------------VCC
NO4-----------------RX
NO3-----------------TX
GND---------------- GND

CONNECTING LCD 16X2 I2C TO ARDIUNO

ARDIUNO----------LCD
5 V------------------VCC
A5-------------------SCL
A4-------------------SDA
GND---------------- GND

This system provides the exact location of the bus with the real-time updated coordinates and also gives an alert to the students as well as the school/college management while this device works when it is fixed to the bus. Firstly the specific coordinate about the specific location are set and feed into the device and through this when the bus cross this location then the alert message with the location update is sent to the students so that the location of bus can be easily traced and can be more useful to the students to board the bus.

SETTING UP SPECIFIC LOCATION

As the GPS is installed the location are fixed as per requirement and when the bus is crossed over the fixed GPS coordinates the message or an alert is sent to the management or student so the live tracking can be done and get the real time location of the bus.
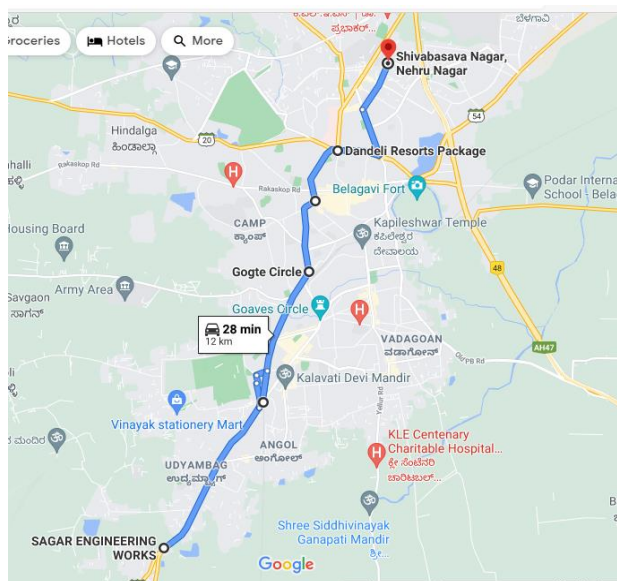

Fig No 6

As the map shows the different location we have set six locations like Sangoli rayana stop, 3rd gate, Gogte circle, Bogarves, Channamma circle, Shivabasava nagar. As per the management of bus schedule is set and the GPS coordinates are feed into the device and when the bus cross this coordinates the management can track the location and get the real time updates.

Similarly the management can set up different location as required in different places and set the bus schedule also so the students can easily get the bus facility and reduce the private vehicle.

GPS TRACKING SYSTEM USING ANDROID MOBILE

In this system application is developed and installed in the android mobile so that the location can be captured by the coordinates. As the mobile phones are very familiar with every person so getting GPS coordinates is very easy with the help of the mobile phone so in this system the application is developed and in that the student registered mobile number is feed while the developing application so when the student sends the SMS to the GPS tracking application then the coordinates are sent to the students and the live location is sent to the students. And as the Google map URL is also sent so that the real time updates can be updates.
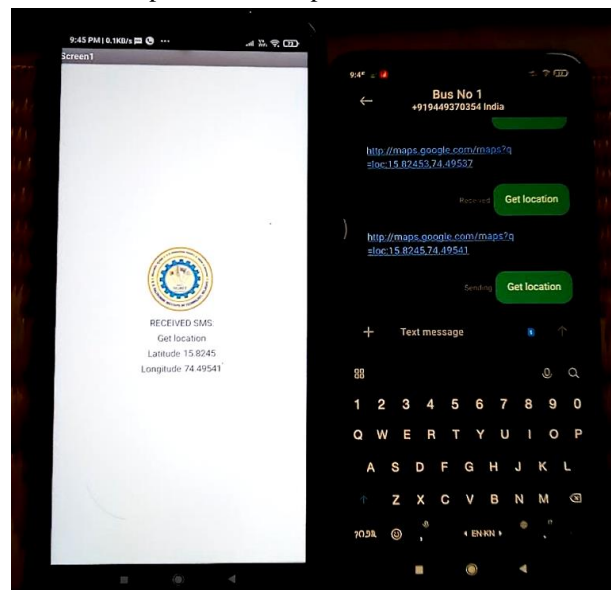

Fig No 7

IV CONCLUSION

From this study of Q-R code attendance system and GPS tracking system the new technology can be improved. As seen there is more time consuming in taking the attendance manually this system can lead to reduce the time and give importance to the development similarly GPS tracking system can also be one of the new technology where it can more helpful for the students and school/college management where it can enhance the usage of public transportation and reduce the usage of private vehicle so that the traffic congestion can be reduced.

V REFRENCE

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