SCHOOL SECURITY SYSTEM USING RFID

[1]Chanchal N. Patil, [2]Vaishnavi D. Pagar, [3]Shreeyash S. Rakibe, [4]Sagar R. Deshmukh, [5]Dr. Purushottam R. Patil

[1,2,3,4,5] Computer Science and Engineering
[1]Department of Computer Science and Engineering,
[1,2,3,4,5] Sandip University, Nashik, India

Abstract: Recently, crime against children is increasing at higher rate and it is high time to offer safety system for the children going to school. 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 consists of two main units, a bus unit and a school unit. The students are tracked using Radio Frequency Identification Devices (RFID) which will be placed in the students' ID card. This information is communicated to the school unit that identifies which of the children did not board or leave the bus and issues an alert message accordingly. The system has a developed web-based database-driven application that facilities its management and provides useful information about the children to authorized personal. The proposed system introduces the concept of cloud and web services to enhance the performance and reliability.

I. INTRODUCTION

Nowadays, parents are worried about their children because of the high rate of kidnapping. Moreover, parents are having long working hours, so they simply do not have as much time to spend for their children. Moreover, they will be persuaded by kidnapper before they enter the school .So, it is the responsibility for the school to take care of their students and they also know in-time and able to send an alert message to their parents if the students are not at the school at school start time. However, it is not easy to do this manually. The school authorities Cannot check their students individually and cannot send an alert message to their students. So, the suitable solution for this problem is by designing a system that will have automatic notification, which will be send to their respective parent's mobile including the admin panel if their children not arrive at school premise at time.

The paper also suggests a bus safety mechanism which is designed to count the entry/exit of students from the bus. The system does various tasks, such as recognizing unique information of each student using RFID tag, which will interchange the data with the RFID reader by means of radio waves and display each student's name on the screen. This will let the driver to know the number of students boarded the bus. Moreover, it also has an emergency switch which driver can use in case of emergency. As the driver presses the switch the message will be send to school authority and parents which will notify them of an emergency. In addition, if the bus departure and arrival is accomplished successfully from the source to destination, it will inform parents through notification about their successful departure and arrival.

II. RELATED WORKS

This section presents the most related work to the problem addressed by this paper. In [7], a system is proposed to track the children using a child module that transmits the tracking information to a database and a mobile device. The disadvantages of this system are that the module may not be convenient for children and wide-scale deployment is expensive. In [6] , This study process a system named Implementing Prototype System for SMS/CSM using RFID. To solve the above-described limitation, with the aims to outline the system requirement to investigate the effects of environment to RFID signal and to justify whether RFID can be used for monitoring students out of SMS/CMS. And the author Dayalan.c[5] will trying to tell that, The information about student such as in time and out time from Bus and campus will be recorded to web based system and the GPS/GSM system automatically sends information (SMS / Phone Call) toothier Parents. That the student arrived to Bus/Campus safely. [3] System will handle, safe route planning, rerouting of routes, school bus position tracking, safety enhancement applications for drivers, warnings for surrounding vehicles and training schemes for school bus drivers. The average speed of cars was significantly reduced by the flashing bus stops. The evaluation will focus on usefulness, effectiveness, acceptance in a user perspective. Author Maryam Said Al-Ismail [6],In his 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 (E.g. 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. 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. In addition, if the bus departs and arrive successful from the source to destination, it will inform the management through an SMS about its successful departure and arrival.

A system [4] that includes a child module and two receiver modules to track the children who is missing. It also sends information about the child cry through text Message to parents. It uses Voice Recognizing sensor to sense the cry of the child. When it matches the cry of the child which is stored in school, it sends the message to parents. The main drawback is the whole system is integrated in a small chip and attached to the person body. It may harm the child. Finally, The Authors MedhatAwadalla, Dawood Al-Abrie, et al in [2] presented the system to enhance the safety of the school children to and from school. This system is used to detect when the child board or leaves the bus and gives an alert message to parents. The disadvantage of this paper is that we can't track the school bus if the school bus gets late to drop the children at the respective places.

III EXISTING SYSTEM

In existing system, they present a system to inform the parents about the status of their children such as absence. The system checks and detects which child enters the wrong bus and issues an alert to this effect. RFID-based detection unit located inside the bus detects the RFID tags worn by the children In addition; the system checks the children absence and updates the database. The parents can log into the system website and monitor the details of their children. The existing system have two units, the school unit and the transportation unit.
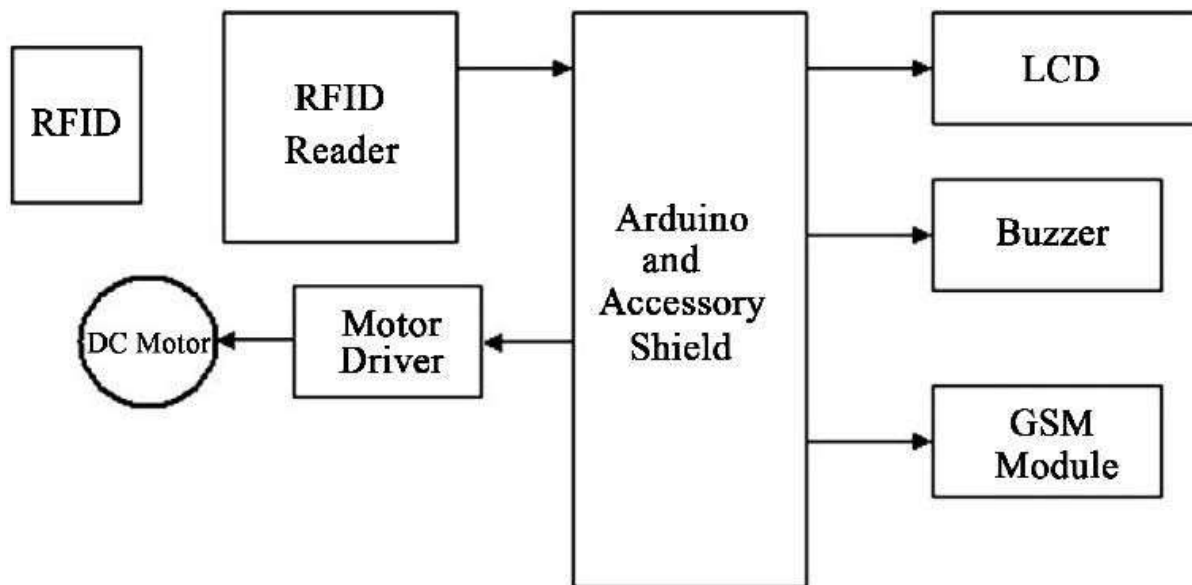
System block diagram of Existing system

The bus unit describes about the detection of the children when they enter/leave the bus. RFID technology is used to achieve this process. Controller will check if this read ID is matched with the student list stored on SD card. The buzzer will alarm if the ID do not match. And the School Unit consists of a server and GSM module. The server acts as database server and web server. In addition, the server communicates with an SMS gateway to send notification in case a child is detected missing. [11] Proposed a system about Efficient Sensor Network for Vehicle Security. Today vehicle theft rate is very high, greater challenges are coming from thieves thus tracking/ alarming systems are being deployed with an increasingly popularity. As per as security is concerned today most of the vehicles are running on the LPG so it is necessary to monitor any leakage or level of LPG in order to provide safety to passenger.
The existing system has the components like RFID tags, RFID reader, buzzer, controller for the transportation unit. And for the bus unit, it consists of the same components with GSM module. And this System has a web application which helps the children's parents to monitor their students frequently. The main advantage of this system is, the parents can get notified whenever their child get boarded to the bus and leave from the bus. Also they can notified when their child get into the wrong bus. But the drawback of this system is reliability and the parents cannot get notified when their child get sick during the class hours.

IV PROPOSED SYSTEM

a) GOAL AND OBJECTIVE
The main goal of the system conveys that the processing speed is been increased to a great extent as it is constructed on the cloud. The performance is boosted and the consistency is maintained. The objective is to maintain the whole working of the system using the web services. The emerging technology can behold the capacity of the cloud based dynamic system and work reliably both on the client side and the administrator side.

b) INTRODUCTION
The system comprises of a RFID based module connected to cloud storage and a user based android application module simultaneously connected with cloud. The concept evolves from data extraction and storing it according to our means. The users can track their students lively as a geo position tracking is enabled for each and every transportation provided. The service starts from administrator panel. When a student enters the transport, the RFID tag is sensed

and the data is stored as a log in to the cloud storage. The user gets alert on these types of motion of students. The transport system has a geo positioning device installed so that it can transfer its location data to the administrator panel. This panel broadcasts its information to the concerned users and they also provide solutions for the user's enquiries.

The academic details are also provided on the same android application. The requirement is that the android mobile been used should be connected and authorized with the concerned cloud. The alerts are been sent dynamically and the records can be retrieved from the cloud on user request. As the cloud system is been introduced and if the hardware is reliably used, the data from the cloud can be retrieved dynamically with an increased amount of speed. The user manipulation and student alerts can be automated without any integration or permission with the administrator panel if needed increasing the processing speed of the whole system.

c) SYSTEM DIAGRAMS

The following diagram is the main infrastructure architecture of the proposed system,
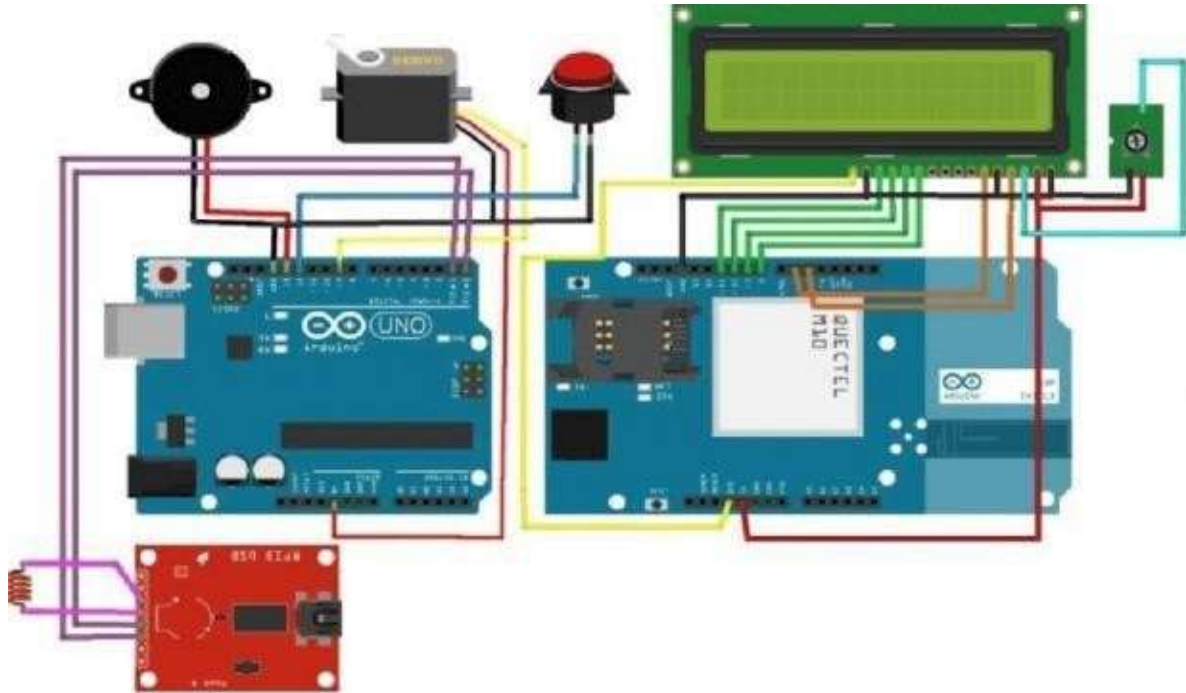
The proposed system consists of two units, the school and the bus unit. Here we proposed our new idea, that is the concept of cloud and webservices. When the rfid tag can be scanned, the details of the particular student is been updated in the respective databases at the same time the alert notification will be send to the respective parents mobile. All these actions are integrated with the cloud and webservices. So that the reliability and the dynamism will get improved.

d) IMPLEMENTATION

The implementation of the system initiates with a RFID tag. The tag can be installed onto a students badge in the uniform or identity card. The tag data is read by the reader on entering into its area of access.
The readers data is processed by the Arduino board and the data is collected by the microcontroller in it. The data is neither sent nor processed, it is just collected on to the board. Dynamically, the values from the board is sent through an Ethernet module integrated with the Arduino board. The Ethernet allows the board to send the values through a medium of Ethernet like internet or to the administrator system.

The system consists of values been authorized first and sent to the cloud storage. The student attendance in the transportation is dynamically alerted to the parents or the users. The process involves the student entering the bus, getting out of the bus, alerting the location being nearing to the parents and buzzing in the bus. Situations occur like the student gets sick at the school time and needs to recover by going for medication or getting him home. In case of such emergency, the staffs handling in the current situation can just scan the RFID tag of the student by the mobile module and calling the parents mobile immediately and inform them about the current situation. This makes a bit easier and avoids the searching of the student details in the directory and then calling them.
At the user side, the android application should be installed and the authorization must be taken place in order to track their concerned children. The application gives the clear status about the children by means of colour code status. The records can be retrieved for the students for the past days also as it does not get any problem.
The log data on the cloud can be retrieved at any time. But the cloud data can be cleared on a student current academic year. Even this time period can be reduced for storage as it is not needed much. The emergency alert situations can be handled with care for the children. The attendance at that time for the transport will be marked accordingly and alert will be changed as occurrence. The user application shows the live geo positioning tracking of the transport and if not viewed, it gives the alert when the transport is nearing the pit stop of the concerned student. The student been stayed in the transport or the school is also alerted for the time sessions been

allocated. The student if he boards the wrong bus, alert is been sent.

The transport availability if changed is been alerted to the administrator panel and the transports travelling through the same routes should have their all-bus's students details coded. The failure of the transport and breakdowns are alerted by the driver on pushing a button on the bus. The alert will be sent to the parents waiting on the lane. The nearest stop parent will only be affected. The remaining ones can either wait for the transport or get their children by picking them up on the current breakdown location. At that time, the location definition is changed, and the children being picked up are noted and no alert is sent to them on nearing their corresponding pit stop. The application can also give the students' academic details and notices can be sent through the application.

The administrator panel handles the alerts of emergency situation and addition of record and such manipulations. The administrator can broadcast any notices or information to every application of the users. The colour code status avoid the information stack in the screen which proves a weirdness to the users. Important alerts are been notified such as absence, getting out of the coverage area and emergency situations. Remaining notifications are been notified by the colour code and if necessary, the respective information's can be retrieved from the log data of the student. The staff application module can scan the details or search them in their application. Any personal messages or notices can be conveyed from them for their handling areas. On the user side, the notifications been seen is to be ticked and the staffs can confirm that the information has been received and seen successfully by the parents. Thus, the whole implementation can be easily manipulated as it is on the cloud and the overall performance is boosted to a greater extent.

e) ADVANTAGES

The main advantage of the system is performance boost and speed of the result. Due to the introduction of the cloud-based system, the result can be manipulated easily to any platform in future. The data storage is stable and the way of retrieval is based on administrators. And hence, this makes the concept easy for access and availability of the data for all in any platform. Parents can mainly monitor their children's activities and in case of emergency, it is quickly notified.

f) DISADVANTAGES

The vital disadvantage of the project system is availability of internet. As it is a cloud-based system, the processing hardware should be highly configured for reliable and dynamic use.

V. CONCLUSION

Due to increase in crimes against children ensuring safety measures for them in very essential. In this system, FID cards are used along with other technologies to enhance the security. The introduction of cloud has maintained and enhanced the use of the system to the maximum level. Using this system, the concerned authorities, parents can be alerted using spontaneous notifications. By doing so immediate actions can be taken to protect children from accidents. The paper shows that that RFID technology-based tracker system is still acts as one of the best solutions to enhance the safety in the school buses, which will reduce the accidents of forgetting the students inside the bus.

VI. FUTURE ENHANCEMENT

This system can be further implemented using active RFID which can be detected easily by the RFID reader within a minimum range and to improve driver's attention an Omni directional antenna can be used to detect the presence of the students in all directions. Further in case the system can be enhanced using some method to provide immediate action when any child suffers from illness. The most important phenomenon is usage of cloud integration technologies which can prove to be very scalable and adaptable in future. Along with all the above, the highly configured devices can be made which can provide better performance.

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