



Smart Tracking System for Students using RFID

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Abstract: *In many nations, school buses are viewed as effortless options for parents to send their children to their schools. However, nowadays, parents are distressed regarding their wards because of more incidents of students going missing. In certain situations, for the school bus to arrive, pupils may have to wait for a prolonged period. Waiting for school buses to drop off/pick up the children in the morning and then in the afternoon is a waste of time, even for parents, peculiarly with the congestion at peak hours. Certain technologies are available that are employed to guarantee the security of the students, yet they fall short of providing parents with efficient services. The proposed work describes the design of a Bus Boarding Deboarding and Location Notifying System, capable of yielding effective services by providing the amenity to track the bus location using cutting-edge technologies like Global Positioning System (GPS) tracking and Radio Frequency Identification (RFID). The suggested system uses RFID, GPS, and GSM technologies to track pupils within a school bus. Through short messaging services, parents may stay updated on their child's boarding/deboarding status, as well as monitor the bus route and estimate its arrival time. Safe and convenient school buses can cut back on the usage of private cars and eventually alleviate traffic congestion in cities, particularly during school hours. The suggested intelligent and secured tracking system for school buses allows parents to keep track of all buses.*

Keywords: Arduino, Global Positioning System (GPS), Monitoring, Radio Frequency Identification (RFID), Vehicle Tracking, Global System for Mobile Communications (GSM)

I. INTRODUCTION

The safe and reliable transportation of children to and from school via buses has become a growing concern for both parents and teachers in our fast-paced world. Bus delays often lead to extended waiting times for schoolchildren. On occasion, children accidentally board the wrong buses or disembark at the wrong stops, causing worry and inconvenience for parents. Even minor delays of the bus can be a source of frustration for parents. Furthermore, there have been recent reports of school buses transporting youngsters going missing. In one alarming instance, a bus was delayed due to an inexperienced driver who was unfamiliar with the routes. In a school near Salt Lake in Kolkata, as many as three school buses disappeared, leaving parents in a state of panic. Each bus carried around 40 children, and all three drivers had turned off their cell phones. Consequently, numerous parents rushed to the schools when their children did not return home at the usual time. However, this perplexing issue can be effectively addressed with the aid of modern technology. School bus tracking systems significantly enhance the security and peace of mind for schoolchildren and their parents. While a few such products already exist in the market, the suggested system stands out as superior to its counterparts, thanks to its use of the Arduino UNO microcontroller. It also utilizes the MFRC522 RFID Reader, NEO-6M GPS module, and SIM800A GSM module, all of which are reasonably priced, thereby reducing the overall cost. Each child is uniquely identified by their RFID-tagged school ID card, and parents are promptly notified of their children's boarding and disembarking status through a Global System for Mobile Communication (GSM) module. Parents receive notifications indicating whether their child has boarded the bus or not. Furthermore, the Global Positioning System (GPS) module sends real-time updates about the bus's current location to the parents via

II. PURPOSE

SMS, allowing them to stay informed about its whereabouts, including any potential traffic-related delays. Even if a child is unable to board the school bus on their way home, parents are promptly alerted. This Bus Boarding-

Deboarding and Location Notifying System serves as a valuable tool to help parents remain informed about their children's journey, address any concerns that may arise along the way, and plan their schedules accordingly

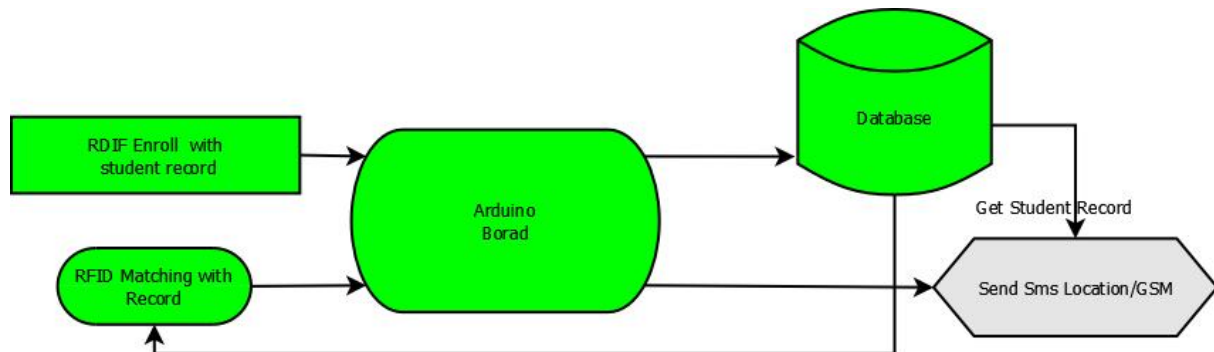
III. OBJECTIVE OF SYSTEM

- Developing a Application for Student and parent for obey Traffic Rules.
- Designing a real-time data transmission system to storage.
- Implementing IOT system for smart india.
- Creating a user-friendly web or mobile application interface for user and rto for speed details and location.
- The scope of the project includes designing the hardware and software components, integrating sensor data with IoT technology, implementing data analysis algorithms, and creating a user interface for interaction.

IV. PROPOSED SYSTEM

The safe and reliable transportation of children to and from school on buses has become a matter of concern for parents and teachers in today's busy world. Bus delays can often lead to long wait times for school children. Sometimes, children accidentally board the wrong buses or get off at the wrong stops. Even minor delays can cause anxiety for parents. Recent reports have highlighted instances of school buses transporting young children going missing. In one case, a bus was delayed due to an inexperienced driver who was unfamiliar with the routes. In another alarming incident. Through short messaging services, parents may stay updated on their child's boarding/deboarding status, as well as monitor the bus route and estimate its arrival time

SYSTEM ARCHITECTURE



Safe and convenient school buses can cut back on the usage of private cars and eventually alleviate traffic congestion in cities, particularly during school hours. The suggested intelligent and secured tracking system for school buses allows parents to keep track of all buses

V. CONCLUSION

To identify an effective strategy to keep track of each and every student's boarding and deboarding the school bus, accessing the information about the live location of the school bus is crucial. By adopting the least expensive, yet most effective sensors, the cost is maintained to a minimum, improving the working. Parents get notified about the student's boarding and deboarding when the RFID in the school ID card is scanned in the school bus. The GPS of the school bus will also keep the parent updated about the live location of the school bus, and the child traveling in it. The design adopted in this project separates both sensors which makes them work independently. In reference, the inconvenience of calibration and maintenance is involved. In the proposed work, all the drawbacks are recovered. To achieve accuracy for the location coordinates, the program has been constructed in such a way that it accepts GPS latitude and longitude data with a precision of a maximum of six digits, which aids in maintaining the accuracy of the position thus obtained. The GPS and GSM modules contribute to dependability. Its consistent performance, compact design, and low cost contribute to its reliability as well. For the applications mentioned earlier, the module offers a great deal of flexibility and ease of integration

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