

# An Android Application For MSRTC Bus Reservation System

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**Abstract:** The most popular means of travel and transport within the cities is the city bus. It's affordable for a common man. But there are two major problems that arise in this type of transport: one is concerned with the arrival of the bus on time and the other is the seat allotment of passengers. The proposed system aims to handle these two problems with the help of an android application. The proposed system is a RFID (Radio Frequency Identification) based MSRTC Bus Reservation System working on android platform. The system aims to solve the issue related to real time bus tracking, finding out the bus routes, bus schedules and bus stops and online seat allotment/booking. A Bus android device will be interfaced with a RFID module. The conductor will swap the RFID tag associated with each bus stop and android device will update its status to the server. The Bus android device will also display seat booked by user. The RFID module will interact with bus device via blue-tooth; it will read the RFID tag placed in the bus. Thus, the current location of bus will be sent to server via bus device interfaced with RFID module.

**Keywords:** RFID, bus android device.

## I. INTRODUCTION

The city bus transport these days in Maharashtra is becoming difficult due to increasing population and traffic. This ultimately results in delay of arrival of bus at a particular stop. Also, after waiting for bus for a long time, there is no guarantee that one will get a seat in the bus.

These issues can be solved if there is a real time tracking of bus along-with an online ticket booking facility. Hence, the proposed system is based on RFID based real time tracking and an online ticket booking system for MSRTC. A user can also check the arrival time, bus schedules, bus stops etc.

Radio frequency identification (RFID) has found its uses in security sector as well as asset tracking, manufacturing, supply chain management, access control and retailing. It can be used to track pets, to track newborns, to speed up the toll collection on roadways, to monitor the school bus of a child. RFID also has its uses in identity verification and object

verification. Many times, RFID is embedded in passports, smartcards etc. Since RFID can transmit digital information using short range radio technology between a stationary location (reader) and a movable object (tag) [1]. RFID tags are categorized as active tags and passive tags. The active tags, which contain an internal power source, and passive tags, which obtain power from the signal of an external reader[1]. Because of their lower price and smaller size, passive tags are more commonly used than active tags for retail purposes.

### A. RFID COMPONENTS

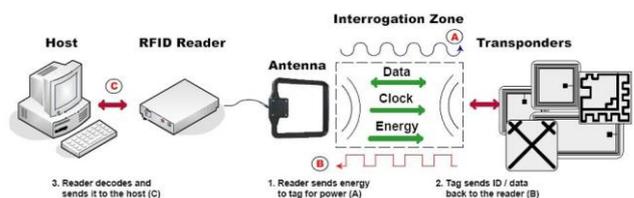


Figure 1.1: RFID Components[2]

The basic components of RFID are an antenna, a reader and a tag[3].

- ✓ The radio signals are emitted by the antenna. These signals activate the tag to read and write the data to it.
- ✓ Reader: It emits radio waves. The range of the radio waves varies according to the type (active/passive) and the frequency. The RFID tag detects the radio waves when it passes through the electromagnetic zone[3].
- ✓ Tag: The tag is a silicon chip that has data encoded in it. This data is decoded by the reader and transmitted to the computer where it is processed[3].

The main use of an RFID system is to enable data transmission by a tag (portable). Reader reads the data and sends it to the host computer to process it according to the needs of a particular application[3]. The tag may provide identity or tracking information or other details according to the application. RFID technology has been used by thousands of companies for a decade or more. . RFID quickly gained attention because of its ability to track moving objects. As the technology is refined, more pervasive - and invasive - uses for RFID tags are in the works.

## II. LITERATURE REVIEW

Many approaches of asset tracking, vehicle tracking and monitoring have been proposed so far. The system proposed by Nayan Jeevagan, Pallavi Santosh, Rishabh Berlia is the RFID (Radio Frequency Identification) based collision detection to provide road safety and avoid accidents. The collision between vehicles is detected by the collision sensors. After detection of a collision, it becomes easier to identify the vehicle details, driver details etc. through the proposed. The details extracted from the tag are used to claim for the vehicle/medical insurance[4]. Kunal Maurya, Mandip Singh and Neelu Jain proposed a real time vehicle tracking system based on GPS and GSM technology to track a stolen vehicle. This system provided the current location of the vehicle lost. This system also has its applications in stolen asset tracking and recovery [5]. R. Manikandan and S.Niranjani proposed a system based on GSM technology. It is a request/query – response system. The main advantage of this system was that it could track multiple vehicles at a time, identify the routes and bus stops on the way and calculate arrival time on each of the bus stops. The GPS module captures data and transmits it to the microcontroller which again transmits it to the control point by making use of the GSM module [6]. The difference between the system mentioned above and the system proposed by us is that the former is making use of GPS/GSM technology and the latter is using RFID technology.

Ergen and Akinci proposed an intelligent tracking of assets for transportation through RFID [7].

After studying various methodologies and applications of vehicle tracking and monitoring, it can be said most of the older research in this field has made use of GPS (Global Positioning System). But practically the information provided by the GPS does not suffice. GPS has low positioning accuracy in the range of 5 to 7 meters [8]. Also, the lane level positioning cannot be achieved by GPS. The signal strength in the remote areas is not strong enough to provide information.

Hence the proposed system uses RFID for intelligent transport navigation that detects and tracks the current and accurate location of vehicle. The speed monitoring and controlling is done with the help of ARM7 based LPC2148 [8].

## III. PROPOSED SYSTEM

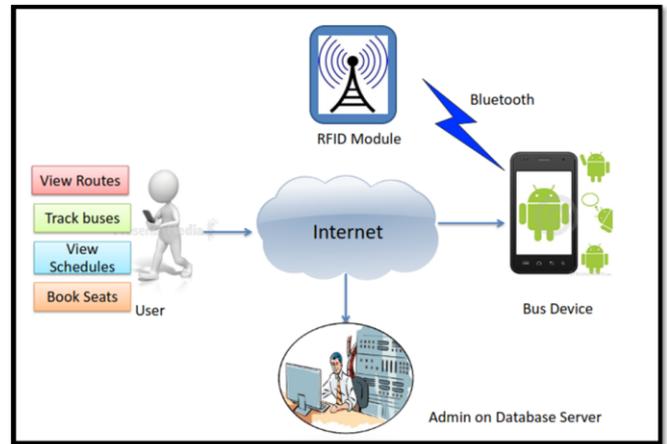


Figure 2.1: System Architecture

The proposed system consists of 4 major modules

### A. ADMIN MODULE

Admin module is a java based desktop application running on database server (Apache Tomcat) from where a legitimate user or system administrator can manage the system. The application is connected through JDBC to the MySQL database. The administrator of the database would have the right to add a new bus, add a route, manage schedule, track bus, track the bus and deactivate any bus in case of bus failure.

### B. BUS ANDROID DEVICE

The bus android device will be interfaced with a RFID module through blue-tooth. The conductor shall swap the RFID tags associated with each bus stop and the android device will update its status to the server. This will help in tracking the current status of the bus and its arrival time prediction at a specific bus stop. The android device will also display the seats booked by the passengers.

### C. PASSENGER APPLICATION

This will be an android application installed on user's smartphone using which passengers can track bus; view bus routes, view bus schedules and also user can book a seat in particular bus.

### D. RFID MODULE

RFID is used as an automatic identification method that stores and retrieves data remotely using RFID tags (transponders). RFID reader and RFID tag work in harmony to store and retrieve data. The RFID module interact with bus

device via blue-tooth, it will read the RFID tag placed in the bus, checks its information and related information about location of bus send to server via bus device interfaced with RFID module.

#### IV. CONCLUSION

It can be concluded that the proposed system based on RFID technology shall give considerable accuracy in locating a vehicle. This system gives a better performance than GPS based system in terms of vehicle tracking. The proposed system can find its applications in MSRTC (Maharashtra State Road Transport Corporation), in tracking of school buses etc. With the help of this system manual working of bus reservation will be reduced, user can review and predict arrival of bus at a particular timing, and book seats. Also the future scope for this application is that it can be extended to detect if the vehicle has undergone any accident or mishap and also call for the hospital services.

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