

# An Optimized Performance Validation of Passenger Journey Using Smart Card

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**Abstract :** Now a day at present we use paper tickets which are printed by a small machine with a key pad in transportation system. This process needs man power and we don't know the details of the passengers which are utilizing the transportation services. This paper is based on the concept of changed ticketing structure by using RFID technique. In order to guarantee the traveler venture without any quarrels and work we utilize this technique that replaces the customary paper ticketing by RFID tickets only utilizing of RFID cards, which enhances the accommodation and security of exchange. In this, the RFID card contains all details of the user including bank account information. If the people confirm to go in certain bus, by using RFID tag the person can travel in a vehicle simply showing the tag on tag reader, at that point entryway opens naturally and after some predetermined seconds it gets closed. The amount is lessened from the passengers account according to the distance. After that the lessened amount details will be sent to that particular traveler using GSM. In this we can likewise presenting the automatic declaration and showing of travelling data, for example, travelling route, next phase of travelling and no. of .persons going in a vehicle. APR 9600 module is placed inside the bus for the audio announcement of root of travelling.

**Keywords :** ARM7 microcontroller, RFID reader, GSM, APR 9600 and IR sensor.

## 1. INTRODUCTION

The main aim of this frame work is to improve the public transport system and managing it accurately. This frame work can overcome the problems in present transportation system (traditional ticketing) such as trading tickets beginning with one individual then onto the following, sharing of tickets, and no idea of travelling roots for strangers and illiterate people [2]. This frame work presents RFID technology for providing transportation without paper ticketing and it also announce the traveling roots in order to get idea for illiterate people and strangers. This advancement makes no need of man power and maintenance of ticketing machines [1].

In natural transportation the passenger should carry his money for ticketing and he also carries that ticket till the end of his journey. As well as the conductor should be know how many persons are travelling in a vehicle. These are all over come by the current frame work by using RFID technology. In this RFID tags contain an inserted electronic chip which stores the person's details and exchange information [2]. Whenever the passenger wants to travel on a bus, first he has to swipe the RFID tag on RFID reader. Then the reader read the details of person from the tag and transfers to the controller. Then the controller checks the account details such as available balance. In this frame work each person should allocate with a RFID tag. Depending upon the passenger traveling distance amount will be fared from the tag [3].

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In this frame work the information about the transportation such as no. of. Persons in vehicle and next stage of travelling will makes simple to passengers as well as transport system [4]. In this frame work the passenger need to swipe RFID tag twice on RFID reader in order to make a journey. First one is before boarding a vehicle and another one is at the destination spot. Then according to the travel distance the amount is fared and the message will sent to that person through GSM. The voice announcement from APR 9600 in the transport makes the framework simply [5].

The rest of the paper organizes as follows. Existing system, Current frame work, Implementation, Prototype results and concluding remarks in sections II, III, IV, V and VI respectively.

## 2. EXISTING SYSTEM

In the general, every transport is controlled by a conductor. The conductor will take the money from each traveler for their journey ticket. Now a day, we are using paper tickets or tokens as tickets. The handheld machines are used to print tickets. The traveler need to carry the ticket till the end of his travel, the conductor should be check that everyone has the ticket. [5] The time taken for ticketing is generally more and it is depends upon to print the Ticket and also if passenger doesn't give exact fare means exact change for that ticket cost. Nowadays' conductors are trained to work the handheld ticketing machine.

In Existing framework RFID Reader is used to travel in vehicle however destination should to be entered by traveler on keypad which is placed at RFID reader, So that amount will be charged consequently from the tag[5].

## 3. CURRENT FRAME WORK

In our present frame work, no need of man power to maintain transportation system. Each passenger is having their individual RFID tags which can be given based on their identity proof. These RFID tags can be used as passenger identity. The RFID reader can read the data from tag. The reader checks the passenger identity and their account balance details. These RFID tags should be capable of recharge in order to use it again and again [2].

[8]Every time when the traveler enters the vehicle he needs to swipe his RFID tag on the RFID reader. Then the door is opened if it is valid, otherwise buzzer will be on. While leaving the transport the passenger should swipe the tag once more. On swiping tag for the second time the microcontroller will recover the information about specific passenger and figure the travelled distance. [9]Then microcontroller sends amount fared from account to that particular passenger mobile through GSM.

Adding APR 9600 makes the design simple and easy for passenger. APR 9600 will send the travelling information through loudspeaker [9].

## 4. IMPLEMENTATION

The main objective of this framework is enhancing people in general transport framework benefits and keeps up precisely. This framework predominantly comprises of ARM 7, GSM, RFID framework, APR9600, IR sensor and Motor as appeared in fig beneath.

At first the vehicle entry door will be in closed condition and APR 9600 will exchanges the declaration signals to the speaker. At whatever point the traveler swipes the card on RFID reader, it examines the traveling card of the traveler including the money in account.

In the event that he has sufficient amount then the entry door will be opened otherwise the buzzer will be on indicates that he has low amount to travel in a vehicle. After little amount of time, the entry door will be closed once again. At that point the vehicle will begin its journey. Here the travelling distance is measured with the IR sensors, which will tallies the no. of. Revolutions the wheel is turning. In view of revolutions the amount will be fared, at whatever point the traveler swipes his card again on RFID reader furthermore in view of that exclusive the voice declaration with respect to of stage will be finished. At that the data with respect to faring will be sent to the traveler through the GSM.

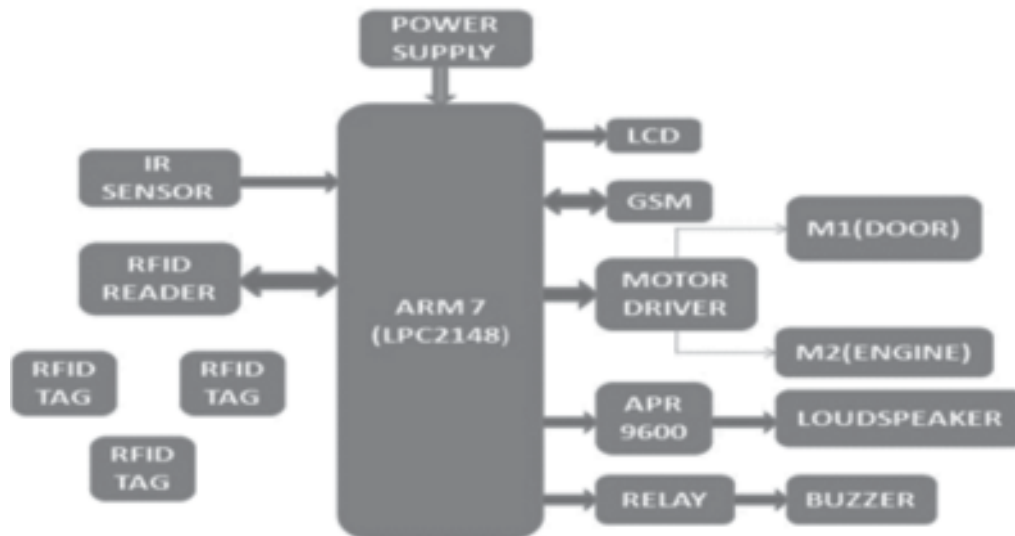


Fig. 1. block diagram of current work.

#### 4.1. ARM7 micro controller

“ARM” is the abbreviation of “Advanced RISC Machines”. It is a widespread processor cores in the world. It is especially used in portable devices due to reasonable performance and low power consumption. ARM is a family of RISC architectures.

##### LPC2148 Chip Features

1. 16-bit/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package.
2. 8 Kb to 40 Kb of on-chip static RAM and 32 Kb to 512 Kb of on-chip flash memory.
3. Single 10-bit DAC provides variable analog output (LPC2142/44/46/48 only).
4. Two 32-bit timers/external event counters (with four capture and four compare channels each), PWM unit (six outputs) and watchdog.
5. Multiple serial interfaces including two UARTs (16C550), two Fast I2C-bus (400 Kbit/s),

#### 4.2. GSM

It requires a SIM (Subscriber Identity Module) card just like mobile phones to activate communication with the network. The use of GSM to send information about the amount fared from the account based on distance travelled.

#### 4.3 RFID

The RFID system consists of RFID reader and RFID tag. The RFID tag is for identification of passenger and their details. While the RFID reader is for scanning the each passenger travelling card and informing the information about the passenger and bank details to the controller. The fig shows the RFID reader module which is used in this project.



Fig. 2. RFID reader module.

#### 4.4. APR 9600

APR9600 is an ease superior sound record/replay IC consolidating streak simple stockpiling method. Recorded sound is retained even after power supply is removed from the module. The replayed sound exhibits high quality with a low noise level. The APR9600 has a 28 pin DIP bundle. Supply voltage is between 4.5V to 6.5V. The APR 9600 module used in this frame work is shown in fig.

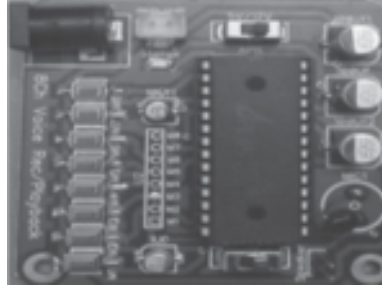


Fig. 3. APR 9600 module.

#### 5. CURRENT FRAME WORK PROTOTYPE RESULTS

The following figure is the working model of project setup on a board. In this we can observe the RFID travelling tags, RFID reader with the APR and GSM modules.

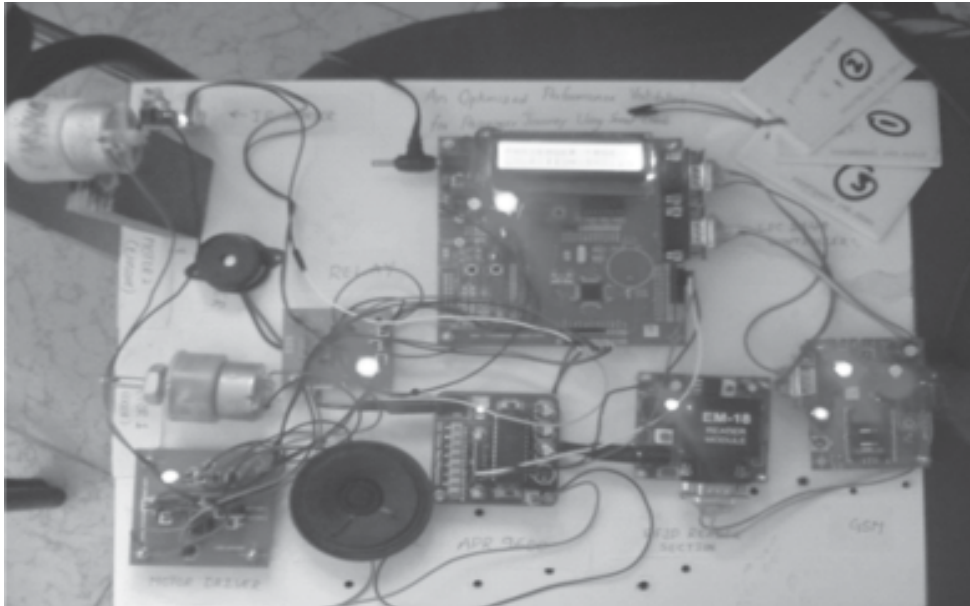


Fig. 4. Current frame work prototype model

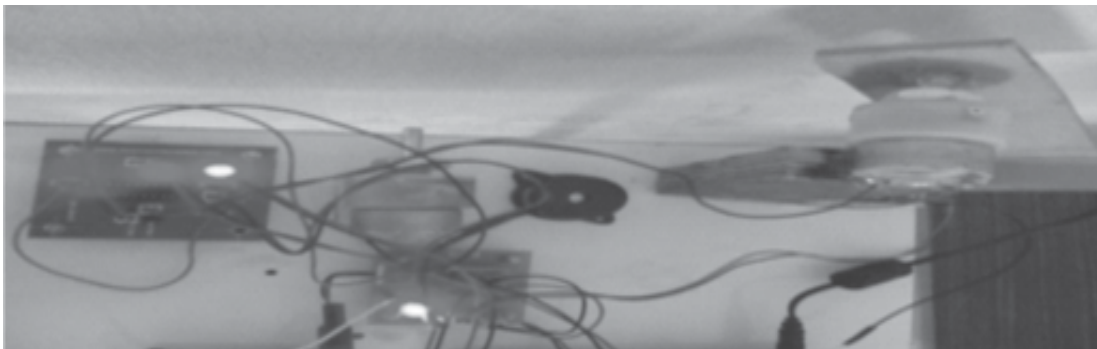


Fig. 5. Motor driver section

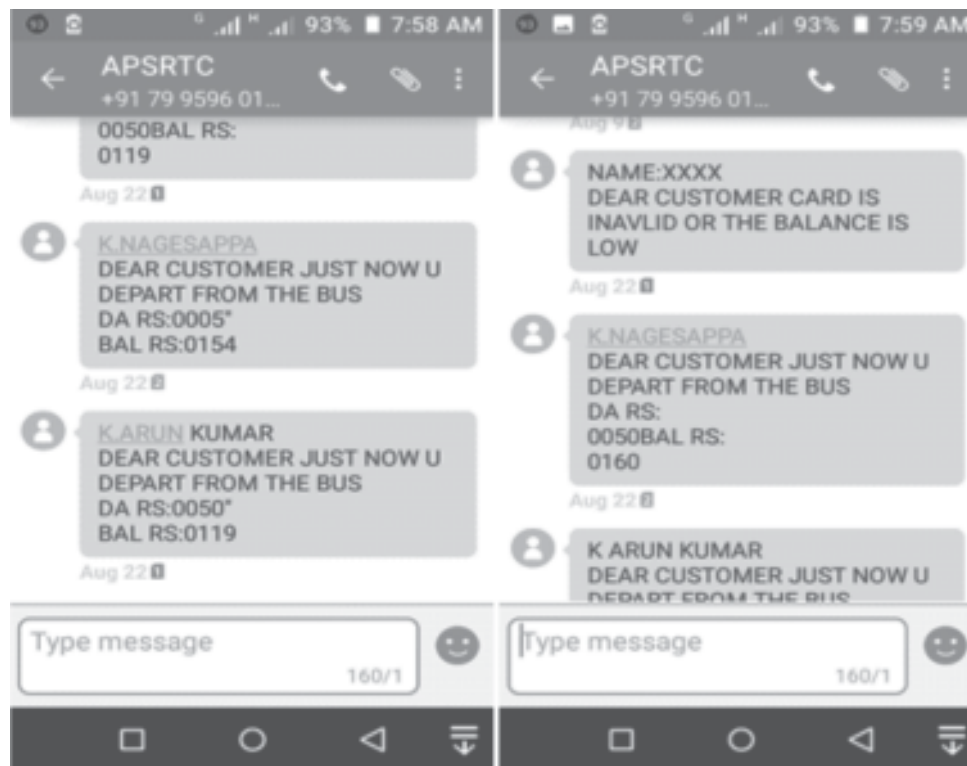


Fig. 6. Messages sent by the GSM about fare.

In above figures, the first one is the entire prototype unit and next one is the motor driver sections which indicates the door system of the vehicle and also distance measurement system. The final is information about the fare sent by the GSM in the form of SMS.SSS

## 6. CONCLUSION

By implementing this paper as a real time project many disadvantages of normal ticketing system in transportation system are overcome by our current frame work which is an optimized performance validation for passenger journey using smart cards. It is an innovative idea which reduces man power and also favorable for passengers. The amount is automatically reduced according to the distance travelled by the passenger.

Nowadays almost everyone has ATM card or credit card. This system can be upgraded by changing the program for using ATM card or credit card instead of smart cards. Also can use APR 9600 module to announce the travelling root and next stop of journey. Furthermore GSM can be adding to send the data about deducted amount. As a future scope we can also include biometrics for providing security.

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