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RFID Based Fare Collection System in Public Transportation

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Abstract: Nowadays 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. 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 also displaying the number of passengers travelling in a vehicle.

Keywords: ARM7 Microcontroller, RFID Reader, GSM.

I. INTRODUCTION

The fundamental point of this edge work is to enhance the general population transport framework and overseeing it precisely. This casing work can conquer the issues in present transportation framework (conventional ticketing, for example, exchanging tickets starting with one individual then onto the accompanying, sharing of tickets, and no thought of voyaging roots for outsiders and unskilled individuals. This casing work presents RFID innovation for giving transportation without paper ticketing and it additionally report the making a trip establishes keeping in mind the end goal to get thought for uneducated individuals and outsiders. This progression makes no need of labor and upkeep of ticketing machines.In regular transportation the traveler ought to convey his cash for ticketing and he additionally conveys that ticket till the end of his trip. This is over drop by the present edge work by utilizing RFID innovation. In this RFID labels contain an embedded electronic chip which stores the individual's points of interest and trade data. At whatever point the traveler needs to go on a transport, first he needs to swipe the RFID tag on RFID reader. At that point the reader read the subtle elements of individual from the tag and exchanges to the controller. At that point the controller checks the record subtle elements, for example, accessible adjust. In this edge work every individual ought to assign with a RFID tag. Contingent on the traveler voyaging separation sum will be fared from the tag. In this edge work the traveler need to swipe RFID label twice on RFID reader so as to make an excursion. Initial one is before boarding a vehicle and another is at the goal spot. At that point as indicated by the travel remove the sum is fared and the message will sent to that individual through GSM. 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.

II. EXISTING SYSTEM

In the general, each vehicle is controlled by a conductor. The conductor will take the cash from every explorer for their excursion ticket. Presently a day, we are utilizing paper tickets or tokens as tickets. The handheld machines are utilized to print tickets. The voyager need to convey the ticket till the end of his travel, the conductor ought to be watch that everybody has the ticket. The time taken for ticketing is for the most part more and it is relies on to print the Ticket furthermore if traveler doesn't give correct passage implies correct change for that ticket cost. These days' conductors are prepared to work the handheld ticketing machine. In Existing system RFID Reader is utilized to go in vehicle however goal ought to be entered by explorer on keypad which is set at RFID reader, So that sum will be charged therefore from the tag.

III. CURRENT FRAME WORK

In our present edge work, no need of labor to keep up transportation framework. Every traveler is having their individual RFID labels which can be given in view of their personality confirmation. These RFID labels can be utilized as traveler character. The RFID reader can read the information from tag. The reader checks the traveler character and their record adjust subtle elements. These RFID labels ought to be fit for energize keeping in mind the end goal to utilize it over and over. Each time when the explorer enters the vehicle he needs to swipe his RFID tag on the RFID reader. It is going to check the balance details, if it is OK the system starts working and if it is not buzzer ringer will be on. While leaving the vehicle the traveler ought to swipe the tag yet again. On swiping tag for the second time the microcontroller will recoup the data about particular traveler and deduct the sum from their record. At that point

microcontroller sends sum fared from record to that specific traveler versatile through GSM.

IV. 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, and RFID framework, as appeared in fig beneath.

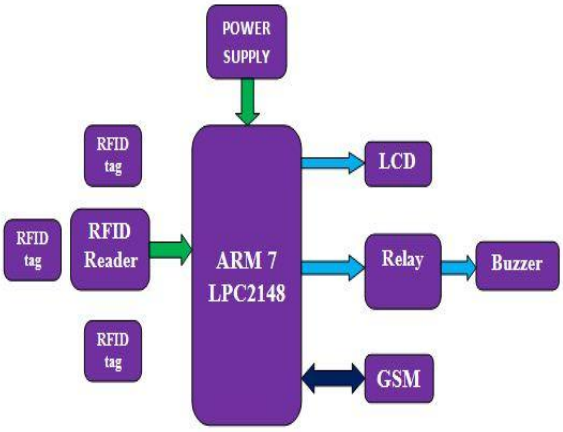

Fig1. Block Diagram of Current Work.

At first the vehicle passage entryway will be in shut. At whatever point the explorer swipes the card on RFID reader, it inspects the voyaging card of the voyager incorporating the cash in record. If he has adequate sum then the system starts working, otherwise it gives the buzzer ring indication. Generally the bell will be on demonstrates that he has low add up to go in a vehicle. By then the vehicle will start its excursion and the travelling distance count is displayed on LCD. In perspective of voyaging separation the sum will be fared, at whatever point the voyager swipes his card again on RFID reader. At that the information as for faring will be sent to the explorer through the GSM.

A. ARM7 micro controller:

"ARM" is the condensing of "Advanced RISC Machines". It is an across the board processor centers on the planet. It is particularly utilized as a part of compact gadgets because of sensible execution and low power utilization. ARM is a group of RISC structures.

LPC2148 Chip Features:

- 16-bit/32-bit ARM7TDMI-S microcontroller in a minor LQFP64 bundle.
- 8 Kb to 40 Kb of on-chip static RAM and 32 Kb to 512 Kb of on-chip flash memory.
- Single 10-bit DAC gives variable simple yield (LPC2142/44/46/48 as it were).
- Two 32-bit clocks/outside occasion counters (with four capture and four analyze channels each), PWM unit (six yields) and guard dog.
- Multiple serial interfaces including two UARTs (16C550), two Fast I2C-transport (400 Kbit/s).

B. GSM

It requires a SIM (Subscriber Identity Module) card simply like cell phones to initiate correspondence with the system. The utilization of GSM to send data about the sum fared from the record in view of separation voyaged.

C. RFID

The RFID framework comprises of RFID reader and RFID tag. The RFID tag is for recognizable proof of traveler and their subtle elements. While the RFID reader is for filtering the every traveler voyaging card and advising the data about the traveler and bank subtle elements to the controller. The fig demonstrates the RFID reader module which is utilized as a part of this venture.

Fig2. RFID reader module.

V. PROTOTYPE RESULTS

The beneath figure demonstrates the working stream operation of the Automatic Fare Collection System in Public Transportation. The framework begins working from showing of traveler's include voyaging a vehicle onwards.

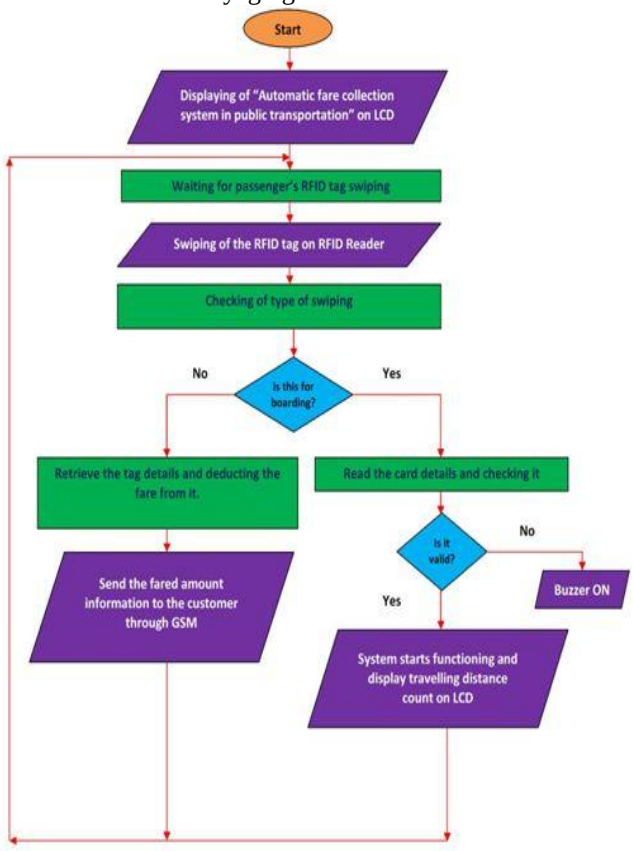

Fig3. Flow of System Work.

At that point it is sitting tight to swipe of RFID tag on RFID reader. After that it will affirm whether the tag is swiped for boarding or leaving. At that point in light of the prerequisite it is working. That implies, in the event that it is boarding reason then it checks the card whether it is legitimate or not and afterward it starts functioning if card is substantial else it gives ringer sign.

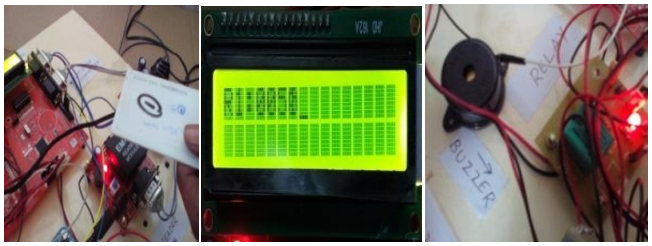

Fig4. The Process of System While Boarding.

At the following case that implies withdrawing time it retrieves the information and afterward deducts the sum from card and after that opens the entryway and after some time again shut the entryway. And after that it sends the data to the client as Short Message Service through GSM. This procedure is going to consistently.

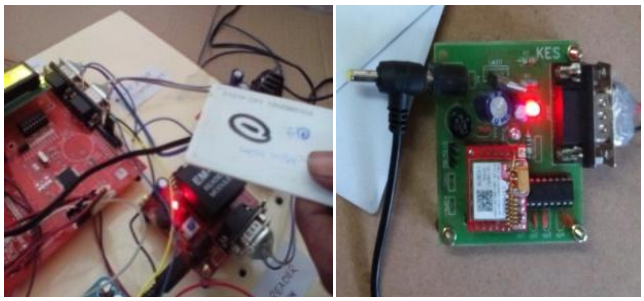

Fig5. The Process of System While Departing.

The messages sent to the customers regarding the fare deduction details is as shown in figure below

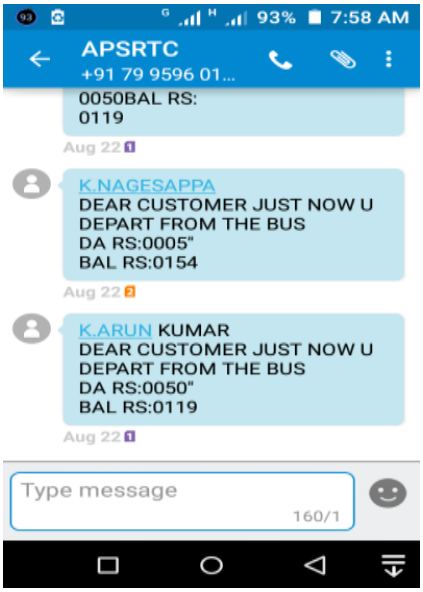

Fig6. SMS Details Regarding Fare Deduction.

VI. CONCLUSION

By executing this paper as a continuous venture numerous impediments of ordinary ticketing framework in transportation framework are overcome by our present casing work which is a streamlined execution approval for traveler travel utilizing brilliant cards. It is an inventive thought which decreases labor furthermore great for travelers. The sum is naturally diminished by separation went by the traveler. These days practically everybody has ATM card or Visa. This framework can be redesigned by changing the program for utilizing ATM card or charge card rather than brilliant cards. Moreover GSM can add to send the information about deducted sum. As a future degree we can likewise incorporate biometrics for giving security. Furthermore we can utilize APR 9600 module to report the voyaging root and next stop of excursion.

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