



Automated Fare Collection for Public Transport Using GPS & Smart Card

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Abstract- At present in public transportation system we use paper tickets which are printed by a small machine with a key pad. This system needs a man power and we don't know the details of the passengers using the public transport. In our proposed system automatic ticketing uses a smart card (digital ticket). This system has smart card system in all the buses. Passenger can swipe the smart card while getting inside the bus as well as getting down from the bus. The smart card would be provided to the passengers. It would be recharged and the bus fare would be detected from the amount for each travel of the passenger. RFID technology also provides for greater security in the system. The ticketing systems using RFID can be merged to solve the above mentioned problems. This paper actually suggests a much more public friendly, automated system of ticketing with the use of RFID based tickets.

Keywords- Global Positioning System, Smart card, Radio Frequency Identification, Automated Fare Collection System.

I. INTRODUCTION

In Public transport system Automated Fare calculation is an Economic and Management Approach for Transit system. This provides a wealth and friendly interaction to everyone with interest in mass transit. In Automated fare collection system, the unit has 2 modes; Passenger mode and Admin mode. Every time the passenger get into the bus RFID reader detects the smart card and GPS founded locations latitude and longitude is updated in the database. While the passenger getting down at the destination the same process is carried out and automatically the fare for the distance travelled is detected from the passenger account. The admin mode is used only by the system admin in transportation centre. The process of crediting the passenger account, issuing new smart cards, monitoring and managing the database etc are done in the admin mode.

II. RELATED WORK

Providing route choice to passengers based on shortest path and low fare. Displaying the current location for passengers using GPS to finding the destination. Extracting the details like passengers most travelled route and number of passengers travelled in a particular bus or a particular route over a period.

Mobile ticketing model with a registered mobile subscription either prepaid or post-paid. By scanning the phone number at the entrance or exit of the bus the identity of the passenger is known then according to the distance travelled by the passenger the amount is reduced from the account balance in the mobile. The difficult factor of this system is use of smart phone. Passengers with normal phone cannot use this technology.

III. EXISTING SYSTEM

Now a day we use paper tickets for public transport which is ejected from a handy machine. This machine is interfaced with a keypad and the tickets are rolled inside it. When the destination is selected via keypad corresponding details are printed on the ticket using handy machine and then

ejected out. This whole process needs manpower. There are some disadvantages in the existing system. They are the passenger details are not known and for unusual passengers the destination points are unknown, knowing the details of the passenger is important in the case of any public issues then, the need of manpower that is every time when a passenger travels through the public transport a person is needed to issue the ticket. Frequent passengers know the actual destination but infrequent passengers do not know the actual destination where they must reach so they need a device which intimates their location. So the above mentioned disadvantages are overcome by our proposed system. The existing handy machine is shown in the figure 1. The conductor issuing tickets using the handy machine is also shown in the figure 2.



Figure 1: Handy Machine

Figure 2: Conductor Issuing Tickets

IV. PROPOSED SYSTEM

In our proposed system the fare collection is automated no man power is needed. All the passengers are provided with a smart card. The smart card carries a unique number which is issued on the basis of any proof of the passenger it may be a ration card or a pan card or a driving license. Hence on any public issues the system can be checked for the passengers list. The smart card has the passenger details and account balance that is credited at the time of card issue, if the account balance reaches the minimum fixed balance it is intimated to the passenger by message then the amount is credited again. The smart card reader system is fixed in the public transport. When the passengers enter into public transport the RFID reader detects the smart card and the current location of the travel (i.e.) source is detected using GPS. Every destination of the route is displayed in the LCD. When the passenger get down at the destination RFID reader again reads the smart card and the location provided by the GPS is updated. The distance travelled is calculated from the source to destination. Based on the distance travelled the bus fare is reduced from the passenger account and the account balance is updated at each travels. This system reduces the manpower, no need of carrying money and it is very useful for unusual passengers travelling to an unknown location. The basic GPS working Architecture is shown in the figure 3 and the expected output of the proposed system is shown in the figure 4.

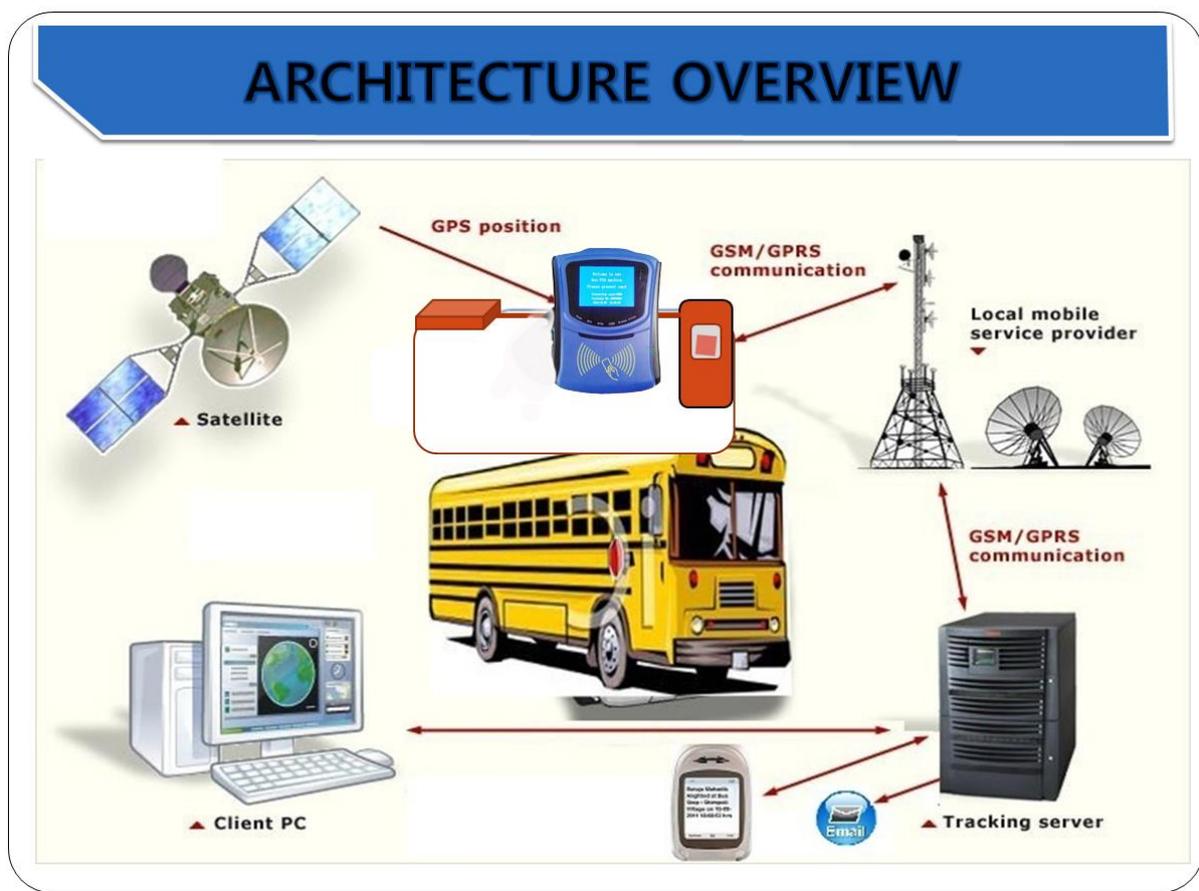


Figure 3: GPS working architecture



Figure 4: Expected output (RFID Reader)

V. FUTURE WORK

If the passenger lost the smart card there is a chance of misusing the card by strangers it can be overcome through deactivating the card by calling the transport customer care centre and sending the passenger identity number and secret code.

In case of minimum account balance or the passenger failed to credit the account during the travel a module can be developed to detect the fare from the passengers registered mobile account.

VI. CONCLUSION

The proposed system overcomes the manual fare collection issues. Automated fare collection system for public transport using GPS and smart card is an innovative idea which reduces the calculation of bus fare and man power. Advanced technology of smart card is implemented in this project.

Passengers have the idea of amount detected for each travel in public Transport. Pre-recharge the card so that the passenger have knowledge how much they are spending for Transportation.

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