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Super Travel Card for Automated Ticketing System

Abhishek Padalkar, Shubham Mandhare, Cashius Raje, Ritu Indla, Prof. Vikas Maral,

BE Student, Dept. of Computer Science, SPPU, K J College of Engineering Management and Research, Pune, India

BE Student, Dept. of Computer Science, SPPU, K J College of Engineering Management and Research, Pune, India

BE Student, Dept. of Computer Science, SPPU, K J College of Engineering Management and Research, Pune, India

BE Student, Dept. of Computer Science, SPPU, K J College of Engineering Management and Research, Pune, India

Dept. of Computer Science, SPPU, K J College of Engineering Management and Research, Pune, India

ABSTRACT: The Local City Travel Bus System handles a large number of passengers. Ticket issue and fare collection play a vital role in the efficient and proper operation of the system. To achieve this objective, the ticketing system shall be simple, easy to use/operate & maintain, easy on accounting facilities, capable of issuing single/multiple journey tickets, amenable for quick fare changes and require overall lesser manpower.

KEYWORDS: Automated Ticketing System; Super travel card;RFID;Raspberry Pi; Public transport.

I. INTRODUCTION

The bus services through the city face many problems in terms of ticket from a stop to another. The main problem is the fare collection. To make this easy and accessible to the public, we designed a system to make the travel disciplined as well as easy.

The fare collection system in a smart city also should be smart and easy, this was the main motivation for the Automated Ticketing System (ATS) to get deeper in the plan. Its goal is to build a system that is as easy as a 'tap' to travel through the city. Automated Ticketing System (ATS) have designed a base system and have fulfilled as many errors and drawbacks of the current fare collection system as we could. System design should be rough and tough, as its handling is done by the general public. In this scenario, the processing system should be fast and accurate. A system which is required for the data processing is also portable and durable. The system is contained with many features like Mobile Application, Web Application, Payment Notifications, Mail notification for each travel with location details with safe and secure data storage. We have designed the system with the help of Raspberry Pi 3B microprocessor development board to build a robust system for rough use.

II. BACKGROUND AND LITERATURE REVIEW

In [1]John Pucher and Nisha Korattyswaroopam, and NeenuIttyerah, (2004)21 : This research paper highlight different problems faced by public transport in India. Such as lack of finance, lack of supportive policies, reduced productivity, etc. It in turn result into inefficiency, high operating cost, increases in personalized vehicles. It also discusses the problems and challenges before public transport systems in India state owned enterprises are also facing the same problems such as shortage of human resources, insufficient training and development facilities, poor working conditions, etc.

The rapid growth of India's urban population has put enormous strains on all transport systems. Burgeoning travel demand far exceeds the limited supply of transport infrastructure and services. Public transport, in particular, has been completely overwhelmed. Most bus services are overcrowded, undependable, slow, inconvenient uncoordinated, and dangerous. Moreover, the public ownership and operation of most public transport services has greatly reduced productivity and inflated costs. India's cities desperately need improved and expanded public transport service.

III. REQUIREMENTS AND ANALYSIS

In[2] the megacities, the conventional system of public transport is based on paper based bus or railway tickets that ultimately lead to chaos among public, system loss, corruption and most of all traffic jam that is responsible for a huge

wastage of time. No prior notification of the arrival and departure of the transports are available creating a lot of confusion among the passengers resulting in a rough argument between them and the bus supervisors or the operators. Again having no government authority to take control or keep an eye over the whole scenario, the private sectors are creating a monopoly, taking control over the public transport and autocratic raise in bus fare. The tracking and ticketing systems using RFID can be merged to solve the prevailing problems. Even though the GPS based system can be designed, we propose the RFID based tickets for its low cost, easy operation, portability, durability, reliability and being much more user friendly. Also the high speed RFID tags and detectors make the tracking system of a running bus merely a child's play.

i. Hardware required

- Raspberry pi 3b
- Rc522 RFID module
- Led display
- Touch screen display
- GSM module
- RFID card
- Pi camera
- GPS module9

The ATS can reduce time to purchase the ticket and increases the convenience of travellers, because a customer can pay the ticket within a single tap. Beside the advantage of customer, ATS also gives an advantage for service provider or public transport authority in monitoring the actual traveller's behaviour.

ii. Design

In order to design and for the Automated Ticketing System (ATS) and to ensure the success of the application of the ticketing bus system. In [3]This project is divided into three main phases of planning and execution as shown in figure 1.

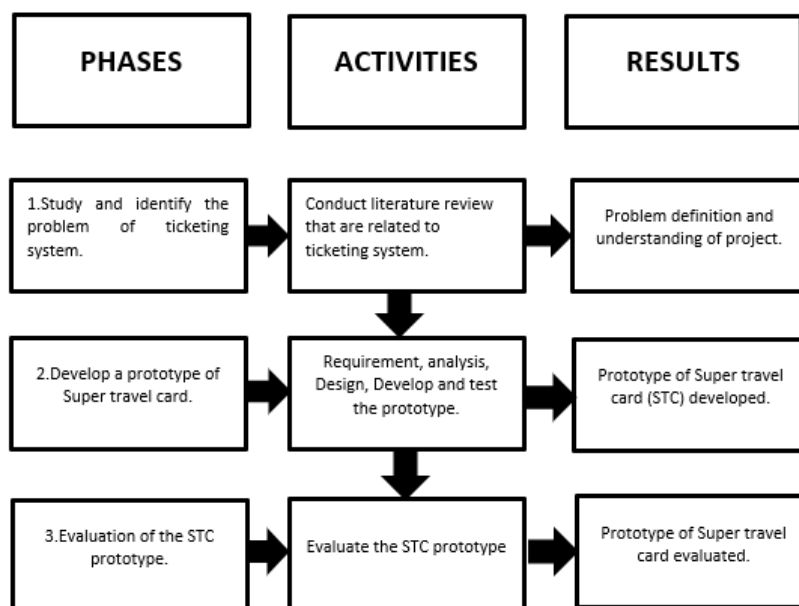


Figure 1. Flowchart of Super Travel Card Designing

In this study we highlight the use of UML to design ATS prototype. Authors have designed a class diagram which is used to show the dynamic behaviour of application design.

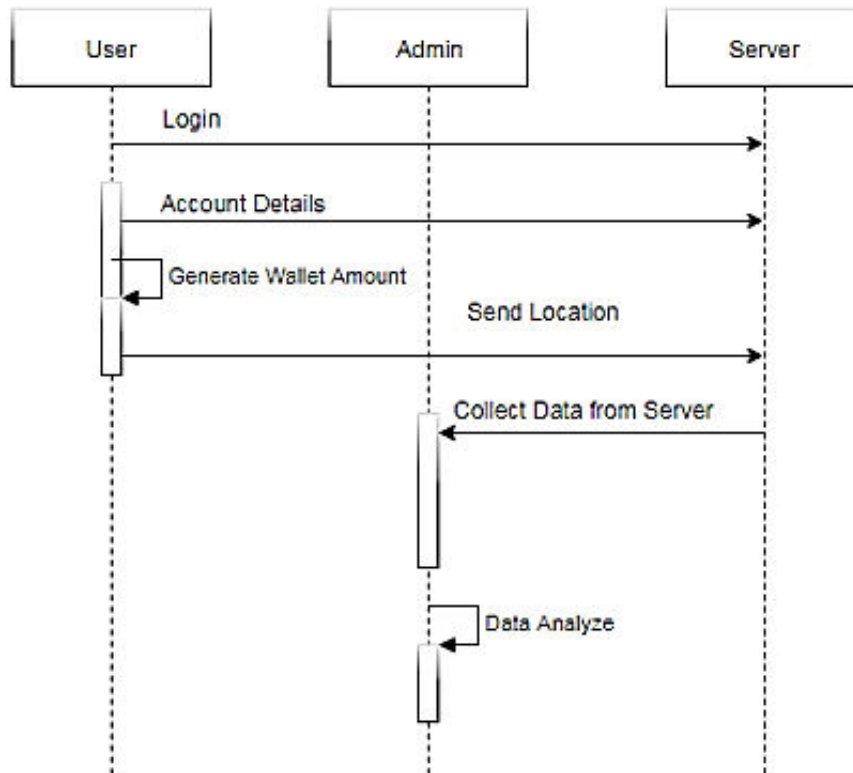


Figure 2. Sequence diagram of prototype

IV. IMPLEMENTATION

The users will be provided with an application, where they have to register themselves by using their mail id and mobile number. A connection will be established as soon as the users register with the administration. Then they have to log in to their account in order to book the card. As soon as their card is verified and validated by the administrator, the RFID card needs to be recharged by paying some amount of money as balance and the card is ready to use. In order to generate the ticket, the user have to use RFID card by tapping on the validator which is provided in the bus. First the system will check if the user is already in or not, if not then the validator will start users journey from that location till the user tap once again its out tap on the validator. The admin gets all the necessary details such as the username, the number of passengers entering into and departing from the bus, the total amount fare collected from a particular bus for the particular route. All these data will be stored automatically in the database as soon as the ticket is being generated to the passengers. The data will be recorded and the amount till the out tap location of the user will be deducted from their account.

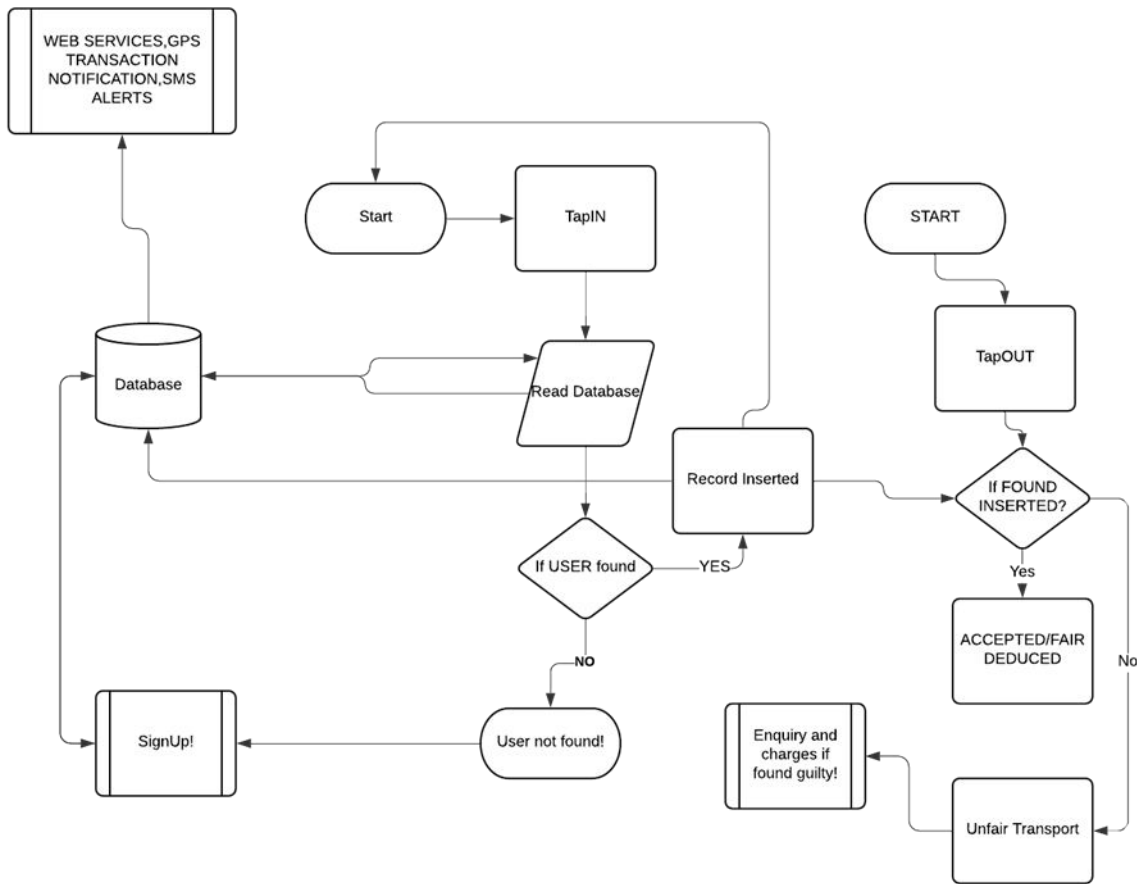
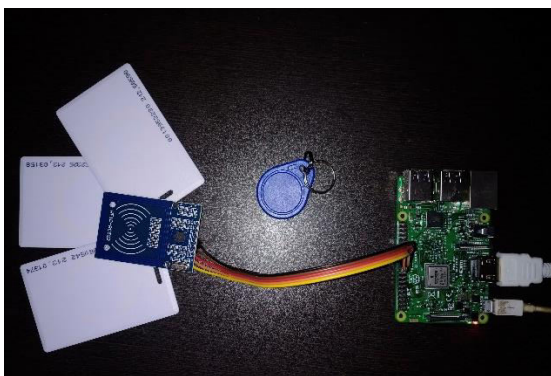
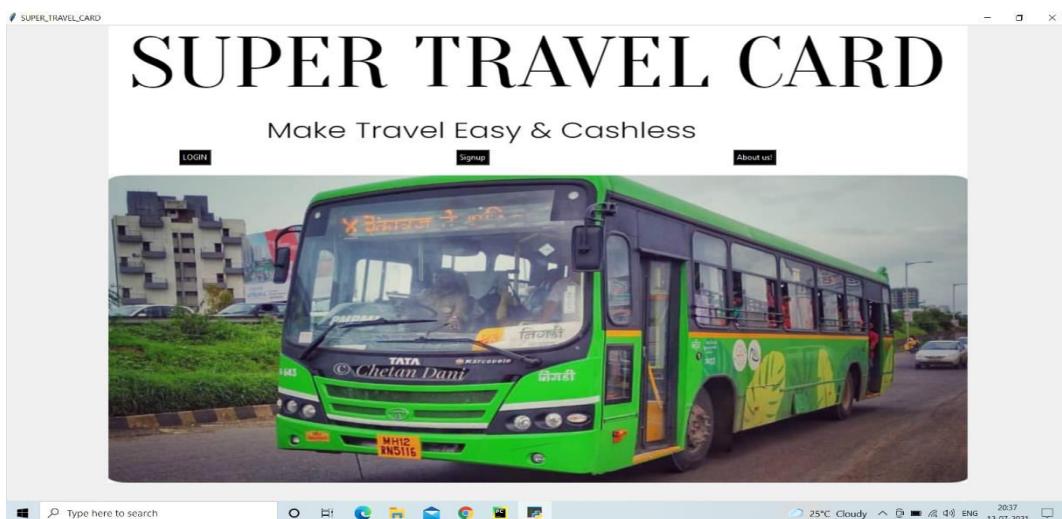
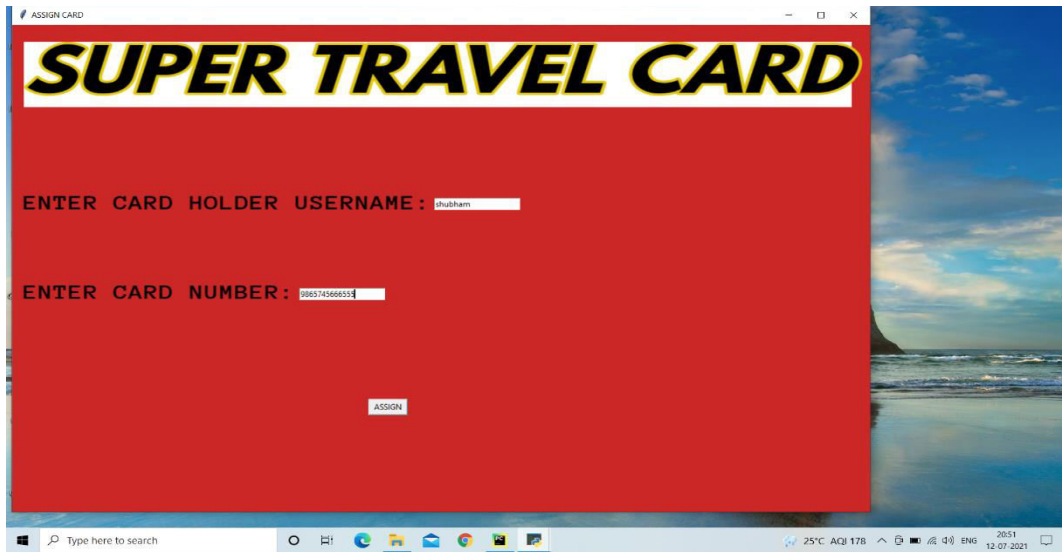


Figure 3. Flowchart of Implementation method

V. RESULT IMAGES AND SCREENSHOTS





VI. CONCLUSION

The system is expected to be fully automated, reliable, transparent and convenient. The whole system can also be used in vehicle on highways, their toll payment and in the railway ticketing system with small or no modification. The cards being reusable, they are much more convenient compared to the paper based ticketing system. The card also can be used to be a universal travel pass card that will allow any transportation on any route. Any unwanted events can be avoided as all the person carrying RFID tickets are monitored every time they travel. Also the possibilities of reducing traffic jams, chaos in the bus stoppage that we usually experienced in the city are immense.

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