Ticketing Solutions for DTC Buses Using RFID Technology

Anurag Srivastava¹, Alok Kumar Dutt² and Meenakshi Sharma³
¹,²,³ (Faculty), Inderprastha Engineering College, Ghaziabad.
¹anurag1350@gmail.com

ABSTRACT
Bus is one of the most important type of public transportation in modern life. People take bus for daily shopping and also for long distance traveling. There are approximately 6,106 Delhi Transport Corporation (DTC) buses operating in 773 routes of New Delhi. Millions of people daily rush on the roads of Delhi. Since buses are one of the best modes of transport available to the common people, it would be impossible to just keep increasing the fares to meet costs incurred due to maintenance, the large workforce and the expansion activities. One such upgradation is the role of information technology and e-ticketing which is achieved with the help of RFID technology.
Radio frequency identification (RFID) is the generic Name for technologies that uses radio waves to automatically identify individual items[3].

KEY WORDS
RFID TAGS, RFID READER, EMRIN PROTOCOL 412 AUTOMATION .

1. INTRODUCTION
Delhi Transport Corporation (DTC) is the main public transport operator of Delhi. It operates buses on many bus routes. It is the largest compressed natural gas-powered bus service operator in the world. DTC is operating Interstate Services in 6 states viz. Punjab, Haryana, Jammu & Kashmir, Uttar Pradesh, Uttarakhand and Rajasthan. The Corporation is operating about 81 Interstate Routes. However, the system is not fool proof and it still lacks many of the much needed technology to keep itself in tune with modern days. Capital becomes the need to serve all these and for ensuring high quality and customer satisfaction. Since money saved is money earned, the paper describes in depth on initiatives that could be incorporated with relative ease that could present solutions for a few major problems that the system presents.

2. RFID TECHNOLOGY
RFID is a technology that helps to identify the animate or inanimate through radio waves. RFID is one of the most fundamental technologies that enables wireless data transmission. Although it has been known for a long time, has not been very often used in Industry. Because it was expensive and there was no standardization among the manufacturing companies. It took a long time to be widely utilized. The intentions of the utilization of the RFID technology have been encouraged in the following ways: by the use of RFID technology, manually achieved workloads will be decreased considerably [1]. RFID technology is universal, useful and efficient [2]. RFID technology increases company efficiency and provides advantages on both company and client-wise. RFID technology is much more secure compared to other networks [4]. RFID labels play an important role as an inventory tracking technology. The tags used can be of two types- active and passive [4]. Passive tags are those which are run by charged internal capacitor. So, an external source of power is required. Active tags are self powered because of the presence of internal battery. Active tags also permit the long range communication between the card and the card reader. If the card reader is portable, then the host computer can be energised at the user’s command. Also, the tag is protected so as to enable its regular functioning even under harsh or extreme ambient conditions.

2.1 HOW DOES THE SYSTEM WORKS??
The sole purpose of this study to utilize such an important technology with an application. In this study, via RFID technology, some solutions are provided for the problems encountered in bus management systems to the present and some important results have been gathered. In this study, the main components of RFID technology which are RFID readers, RFID labels, and software have been utilized. The software aimed to handle the management, controlling, etc.
empowered with a wireless hand-held device consisting of a card reader. Each passenger would be expected to hand out their cards to be swiped by the checker. While swiping, the device could display the details of the passenger like name, age, sex and card number. In addition, the status of available balance before swiping and the travelling chronology could also be displayed. The codes of the destinations could be entered by the checker and hence the exact amount can be deducted. Also, the very idea of a paper ticket as an intermediary between the payment and travel could be forgotten as the card could be credited with money before hand and deductions can be made accordingly.

Since infrastructure and technology are already in place for most of the processes described, these modifications could be easily achieved and this can very well serve the nation.

The unauthorized reader interacts with the card to obtain the data. Eavesdropping is the opportunistic interception of information on the chip while the chip is accessed by a legitimate reader. These problems are possible in any application of RFID but this creates risks when the card is used for an identification purpose where sharing of personal details is involved.

2.4 VERSATILITY OF THE SYSTEM
The same card can be used in other transport too. The Country has been trying to improve the other transport and this can be the best solution to that.

CONCLUSION
With the implementation of the proposed system, the Problem of long queues can be solved substantially. On an average, 6 million people travel daily and hence the amount of paper being used is huge. Such a need never arises in this system. Hence, it contributes to the conservation of trees. It also makes the system secure and user friendly. Such advancements are necessary considering the ever increasing number of passengers in order to make travelling a more enjoyable experience.

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