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**Development of Secure RFID Authentication System for Electronic Inter-Campus Transportation Billing****By****Kolo, J. G., Dogo, E. M., Olaniyi, O. M., and Oyegbemi, S. A.**Department of Computer Engineering,  
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**ABSTRACT**

*A good transportation system is an essential recipe to the economy of every city. This work made attempts to improve the transportation billing system by automating the process using RFID technology, devoid of physical cash collection. Inter-campus University transportation service is taken as a case study. Secure RFID reader and tag was used, employing an AES encryption scheme for authentication, where users register with their student identification card which is their unique RFID tags and credit their account in preparation for future travel. The prototype system is developed to place on hold a faulty vehicle while making suggestions for vehicles that are available for travels. The system also saves the record of each travel with respect to the time and destination of the vehicle. Accuracy and response time were metrics used to evaluate the performance of the implemented prototype system; the accuracy of the system when tested on fifteen (15) different users is 100%, while the system has an average response time of 0.29 seconds.*

**Keywords:** Radio Frequency Identification (RFID); Advance Encryption Standard (AES); Billing system; Feature Driven Development; Transportation.

**INTRODUCTION**

Transportation is the movement of people, goods, and services from one location to another (Bukohwo & Ature, 2014). Hence, transportation has remained an irreplaceable tool for proper development and functioning of any city (Solanke, 2013). There are two basic ways of carrying out this movement, either by private means, i.e. the use of personal vehicles or public transportation services. In a country such as Nigeria, the population is growing due to an increased ratio of maternity to the mortality rate as well as rural to urban migration for work, studies or other business activities. Therefore, the need for more attention towards public transportation service which has drastically increased in recent time, because it helps to reduce the occurrence of traffic congestion (Bukohwo & Ature, 2014).

Public means of transportation is often also seen to be cost-effective compared to the private means. Nevertheless, most public transportation services make use of cash payment while a few use the paper ticketing for billing of passenger fare. This method of payment has posed serious problems to the public transportation services and as well the commuters. Such problems include littering of the environment by paper tickets after being used for travel, irregular transportation billing, and possible payments insincerity by engaged operators and unfair increase in transportation fare by the individual public transporter. The managements of each public transportation service have also been affected, most especially when the service is not being monitored by the owner, since the attendant in