

WEB BASED DAILY OPERATIONAL E-TICKETING SYSTEM FOR ROAD TRANSPORTERS IN NIGERIA

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ABSTRACT:

There is an increase in the number of vehicles plying our roads in Nigeria which will significantly increase the revenue generation to the government as the vehicles normally pay for operational tickets on daily basis which has also brought to light issue of security on our roads. Regrettably, there are several revenue leakage points inherent in the manual system of daily operational ticketing which is making the government not to realize the supposed increased revenue from the road transportation, more so, when there is a dwindling revenue generation from the oil sector. The aim of this paper is to develop a system that will handle daily operational tickets for road transport workers to ensure proper recording and monitoring of ticket revenue. Object oriented analysis and design was used as the methodology for this work. The front end was developed using a HTML, JAVASCRIPT and CSS while the backend is PHP and Mysql for experimental purpose. Test procedures showed that the application passed all the requirements needed for the application to be published and sold in the open market. This application will improve the manual ticketing method, making it necessary to get information about ticketing at real time and eliminate the extra effort and time wastage during such transaction/ticket processing.

Keywords: E-ticket, HTML, Transporter, Vehicles, Smart Phone.

INTRODUCTION

Information and Communication Technology has major potential influences on the mobility of goods and services. It is also taken as important enabler of changes in social and organizational practices, thus affecting the demand for transport in spatial and temporal terms. Technological trends will meet the demand for comfort, safety and speed through advances in ICT in terms of travel information and booking system, traffic and transport management system and vehicle guidance system. The emergence of low-cost computers, widespread cellular network coverage, declining costs of mobile phone hardware; and increasing Internet access have resulted in unprecedented opportunities to support transport services in developing countries. Nowadays, computers become the most important device to accomplish task easily. With wide use of internet, a lot of online shopping, online business, and online booking website are developing to ease the user to do their work. User just need to use few finger click then can buy all the things they need. With this few finger click, user do not need to queue up for a long time to pay for the goods at the cashier's desk.

The popularity of Internet technology has increased substantially over the course of the last several years [14]. As a result, organizations have worked diligently to develop new methods for interfacing with customers. This rapid penetration and use of information and communication technology has also found its way into the transportation sector of the economy. Central to this process has been the development of e-tickets [3]. As noted by [20], e-tickets can be used by a wide range of organizations to provide services including coupons for e-shopping, to tickets for entrance into a concert or sporting event. Although it is not fair to argue that e-tickets have become ubiquitous, it is evident that the proliferation of e-tickets represents a change in the way that traditional ticket purchasing occurs [15]. E-tickets appear to offer a number of advantages to organizations, including lower costs and increased operational efficiency [4]. As such, it is projected that the use of e-tickets will only continue to increase over time [3].

Even though e-ticketing services appear to be the future of operations for many organizations seeking to streamline operations and improve customer service, research regarding e-ticketing and e-service indicates that these processes have not been without their challenges [12]. It was contended by [7] that e-ticketing services, much like many internet and mobile applications, developed in an ad-hoc manner. This has created a situation in which the function and utilization of e-tickets has not been actively integrated into the strategy of the organization. Other scholars examining the adoption of e-ticketing contend that a host of cognitive variables impact consumer decision-making, leading positive or negative perceptions regarding e-ticketing as a principal method for acquiring service within an organization [18].

In the advanced countries like China, Britain, Australia and the United State of America etc., ticketing system in transportation has been automated and has increasingly helped to address the problem of long queue and time wastage problem but coming down to Nigeria aside the air transportation, the use of automated ticketing has not yet been fully implemented in Nigeria.

An electronic ticketing (e-ticket) is an electronic version of a paper ticket, which is stored in a computer system; the idea behind a web-based ticketing and payment system was originally designed and incorporated by airlines operators. E-tickets or cards indicate that the holder has right to specific service. E-tickets give evidence that their holders have right to a specified service and permission to enter a place of entertainment, use a means of transportation or have access to some internet services. E-ticket is a way of documenting sale, checking ticket usage and accounting for payment without the traditional usage of paper system.

An electronic ticketing system for drivers is a computerized system that is designed to allow drivers buy tickets electronically to ease the stress of searching for tickets stands, check previous transactions. The tickets can also be printed out based on the decision of the drivers or saved electronically or obtaining of tickets can also be done electronically at Nigeria Union of Road Transport workers (NURTW) office. The system is designed to address the problem of unauthorized individuals (Agberos) on the road which leads to the increasing visible problems of tout on the road and as such demands an urgent attention by addressing these challenges which will in turn increase government revenue.

The system will make it possible for transporters to manage their payment electronically. The drivers account will contain information about the drivers which was entered during registration process and allow transporters to check previous transactions as well as make payment. The administrator is required to login using administrative password, once it has been authenticated, the administrator will have access to register another administrator, modify all the information stored the database which include updating, deleting and retrieving data from database.

1.1 Statement of the Problem

All public transportation modes in Nigeria, except air transportation still use the traditional ticket system, which is a paper based ticket. The problem with the traditional ticket system (manual ticket) is when users/drivers have to stand to buy ticket or search for ticket vendors in order to purchase tickets daily.

The main issue with manual system is that each ticket vendors works separately, and these vendors acts as middlemen since they also go and purchase the tickets before selling to the drivers. Moreover, there is also a physical limit to the purchase of these tickets during certain hours and purchase can only be made on-the-spot. These limitations are not the only issues the public transport sector is currently facing but it cascading impacts or problems such as human errors (e.g. miscalculations in ticket price etc.). Furthermore, in manual booking system, the paper works can easily be misplaced or lost which means the driver has to purchase another ticket.

Lastly, problems which touts (Agberor) pose to the public transport system is not left out because these group of individuals exploit drivers of funds in the name of Local Government without actually remitting the monies to the concerned authorities and it is actually difficult to trace these individuals. It is equally difficult for drivers to make complaints as they are being regularly opposed hinged on their inability to produce concrete evidences of their tickets which they have previously purchased but misplaced.

2.0 Review of Literature

The first means of transport in human history were people's feet. After somebody had invented a wheel, a lot of various types of vehicles were developed. At present there are a lot of means of transport which help people to move from one to another place, to get to very distant places in a very short time, to overcome seas and oceans and even fly to the stars, to transport huge amounts of goods. People travel in order to reach places that are close or far away, they travel for fun or from necessity. Travelling takes up more time in our lives than most of us imagine. An everyday form of travelling may be going for shopping, commuting to school, to work or visiting friends [22]. There are two ways of travelling: one is using our own means of transport and the other is to rely on the public transportation services. Both goods and services can be transported by land, by air or by water.

2.1 TICKETING SYSTEM

According to [21] a ticket is defined as "a piece of paper or card giving the holder the right to admission to a place or event or to travel on public transport". Generally, a bus ticketing system consists of all the activities involved in producing a ticket, which includes, producing tickets, booking ticket, selling tickets, rejection of the tickets, total tickets produced for a trip and total tickets sold and income gained through the ticket selling. There are two types of bus ticketing system, manual and computerized.

2.1.1 Comparison between Manual and Computerized Ticketing System

After analysing the manual and computerized ticketing system, a summary of comparison between both systems is shown herewith:

(a) System Organization

In the manual bus ticketing system, the sales counter clerk has to write the price, date and others ticket information manually on the ticket to be issued and this is prone to human error. Computerized system will alert the counter clerk if there is an error made,

which will then enhance the bus operators' services [17]. There will not be ticket forgery in the computerized system because the system is updated on real-time basis and keeps track on all the transactions occurred.

(b) Ticket Availability

The manual system is not well organized compared to computerized system. The manual system is less efficient in identifying ticket availability compared to computerized system. Computerized system has clear view of the tickets and how many have sold. The sales counter clerks of manual ticketing system are unable to tell the number of ticket sold until the end of the day operation since it involves multiple sales persons.

(c) Report Generation

The computerized system will automatically generate daily report at the end of the transaction day, but the sales counter clerk has to calculate manually to produce its reports

3.0 METHODOLOGY

In this research study, two types of surveys were conducted (i) to elicit data from several transporters about the purchase and use of manual tickets as it is presently used in Nigeria but specifically in Delta State. (ii) to ascertain their perception in the adoption of e-ticketing system.

3.1 Analysis of the Existing System

In the existing system ticket are being collected from Local Governments Secretariats and distributed by the Chairman of the motorist and cyclist association to various salespersons who then go to various junctions and motor parks from thence the transporters go look for them to purchase these tickets. This ticketing is not transparent because it cannot Account for the amount of revenue contributed by transporters to the state revenue. Transporters cannot purchase tickets without coming in contact with the salesperson and once the ticket is misplaced or lost transporters need to purchase a new one.

3.1.1 Research Design

The study commenced with the administration of questionnaires designed to elicit information currently adopted in the ticketing system for road transporters across some major local Government Areas of Delta State namely, Ughelli North, Ughelli South, Uvwie, Warri south, Warri South west, Ethiope East, Okpe ,Sapele, Ethiope west, Ika North , Ika North, Isoko South and Isoko North. The summary of the questionnaires and their responses for 50 participants are shown in Table 3.1. Considering the questions in 1, 2, 3, 6, 8, 10 and the respondent's high percentage, it is evident that an implementation of a system to handle this problem is highly and urgently needed.

Table 3.1: Analysis of Questionnaire

	Questions	Variable	Frequency	Percentage
1.	Do you keep record of the amount spent on tickets weekly?	Yes	3	6%
		No	32	94%
2.	Do you keep record of the amount spent on tickets yearly?	Yes	5	10%
		No	45	90%
3.	Have you ever been harassed by those thugs on the road?	Yes	33	66%
		No	17	34%
4.	Do you want them to be given uniform in order to be able to identify the official ones?	Yes	40	80%
		No	10	20%
5.	Do you want them removed from the road?	Yes	12	24%
		No	38	76%
6.	Do you think the money paid for tickets actually gets to the state government in full?	Yes	17	34%
		No	33	66%
7.	Is it true that when you are held by these thugs you pay money for tickets they end up not giving tickets?	Yes	45	90%
		No	5	10%
8.	Is it true there are people who don't purchase tickets?	Yes	40	80%
		No	10	20%
9.	Would you prefer the government employ new persons to ensure all transporters get a ticket daily?	Yes	35	70%
		No	15	30%
10.	Have you by any means misplaced your ticket and have to purchase a new one	Yes	37	74%
		No	13	26%

Considering the questions in 1, 2, 3, 6, 8, 10 and the respondent's high percentage, it is evident that an implementation of a system to handle this problem is highly needed.

3.1.2 Problems with the Existing System

Though there is considerable achievement in using the manual system of ticket sales by government, there is need to improve on it giving the merging realities of the recent advancement in technology. The internet revolution has transformed the basics of everyday operation and activity in the society and has greatly influenced and is reorganizing the financial sector and investment habits [13]. Some of the problems of the current system are as follows:

- (i) The current existing system has no transparency and there is no way to actually confirm if the money gets to the state government,
- (ii) Various unauthorized persons exploit both cyclist and motorist for money. We cannot explicitly tell the amount of money contributed yearly to the state revenue by transporters. Also the ticket goes through various persons before finally getting to the transporters.

3.2 Description of Proposed System

The system is very simple in design and to implement. The system requires very low system resources and the system will work in almost all configurations. It has got following features:

- i. It will ensure data accuracy.
- ii. Records will be efficiently maintained by DBMS
- iii. Drivers can also purchase their tickets easily
- iv. Minimum time needed for the various processing.
- v. It will provide better Service.

3.2.1 Architecture of the Proposed System

This process supports existing infrastructure requirements and provides specific recommendations for hardware and network solutions based on existing and projected user needs. Application requirements, data resources, and people within an organization are all important in determining the optimum hardware solution. It is represented using a three tier architecture that comprises of user interface, process management and Database Management System (DBMS). It shows the components of the system, the services they provide and the way they communicate to bring about the system functionality.

3.2.2 Architectural Design of the Proposed System

The system is composed of a web application running online at real time and a database server attached to it. When a client makes a request through a browser, it is sent to the web server who acts on it and gives a response back to the client immediately if the request does not demand any information from the database. On the other hand, if the request demands information from the database, it is forwarded to the database server, from where a response is generated and sent back to the client. The block diagram in Figure 3.2 represents the proposed system.

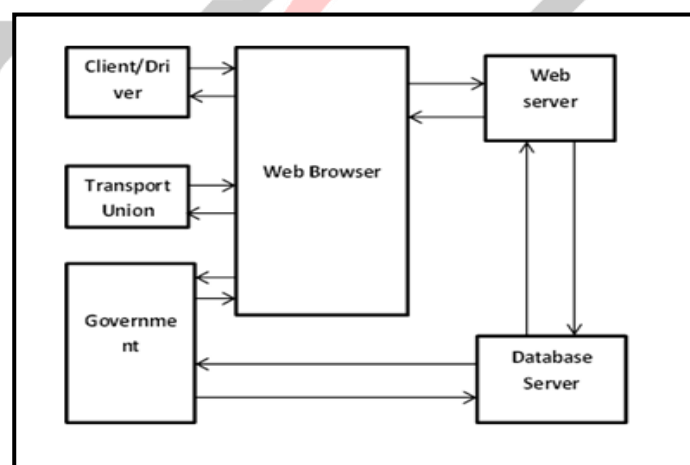


Fig. 3.2: The Architectural Design of the Proposed System

PHP and MySQL are an open source scripting language and database for building web applications, so it is easy for developers to interact with other developers in the PHP community and receive updates on forthcoming versions that can be incorporated into on-going application development projects. The client, transport office agents and government agents opens the web application through a web browser and make its associated request. The request is sent to the web server for further processing and consequently sent back to the web browser as response.

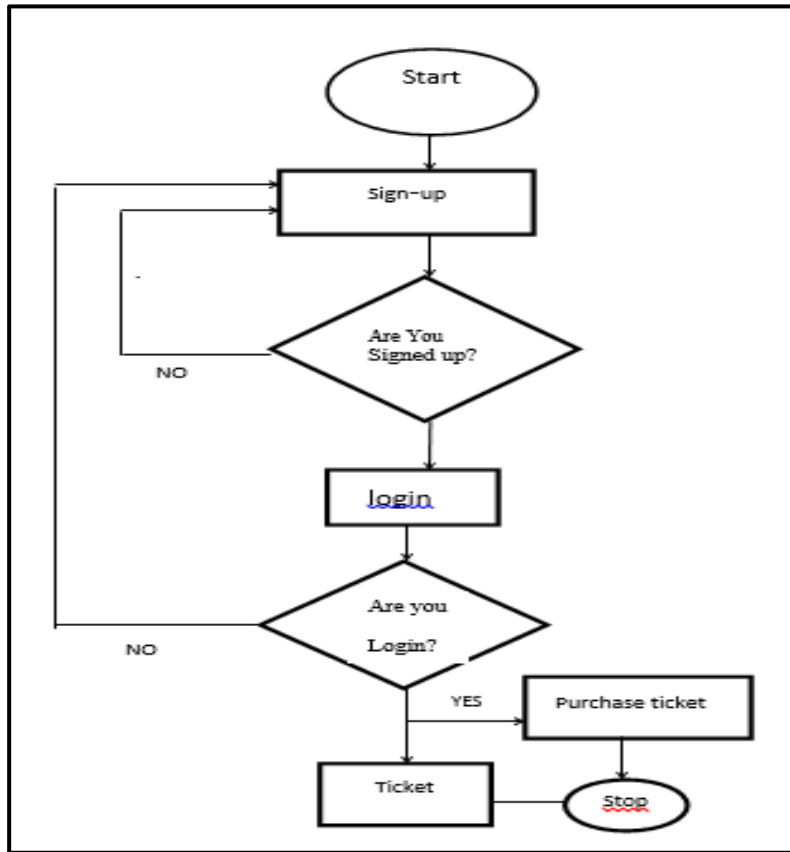


Fig. 3.2: Flowchart of the Proposed System

3.2.3 The Functional Model of the System

The use case diagram describes the requirement of each of the client on the system based on functionality of what the system is expected to do and how to the system will do it. Unified Modelling Language (UML) Use Case diagram of the ticket purchase system is shown in the Figure 3.3.

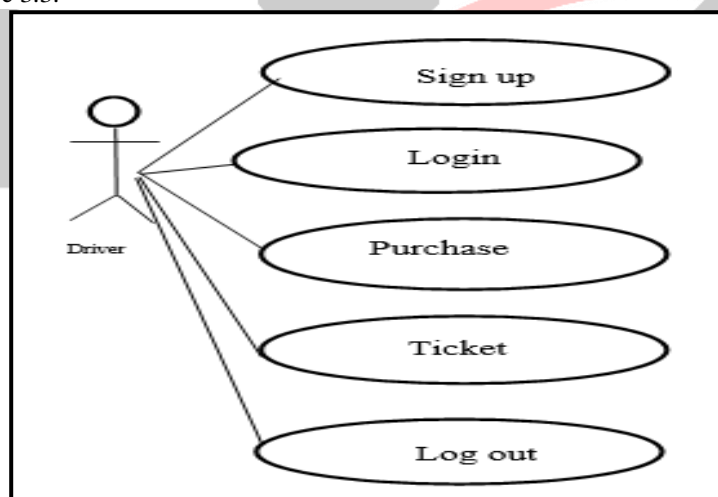


Fig 3.3: Use Case Diagram of the Ticket Purchase System

3.3. Application Implementation

The implementation of the application shows how the application was built, important code snippets and lists of important functions used. The application user interface was coded using Html, JavaScript and CSS as the front end while the backend was PHP and MYSQL database. The layout of the web application is shown in Figures 3.4,3.5, 3.6.3.7, and 3.8.

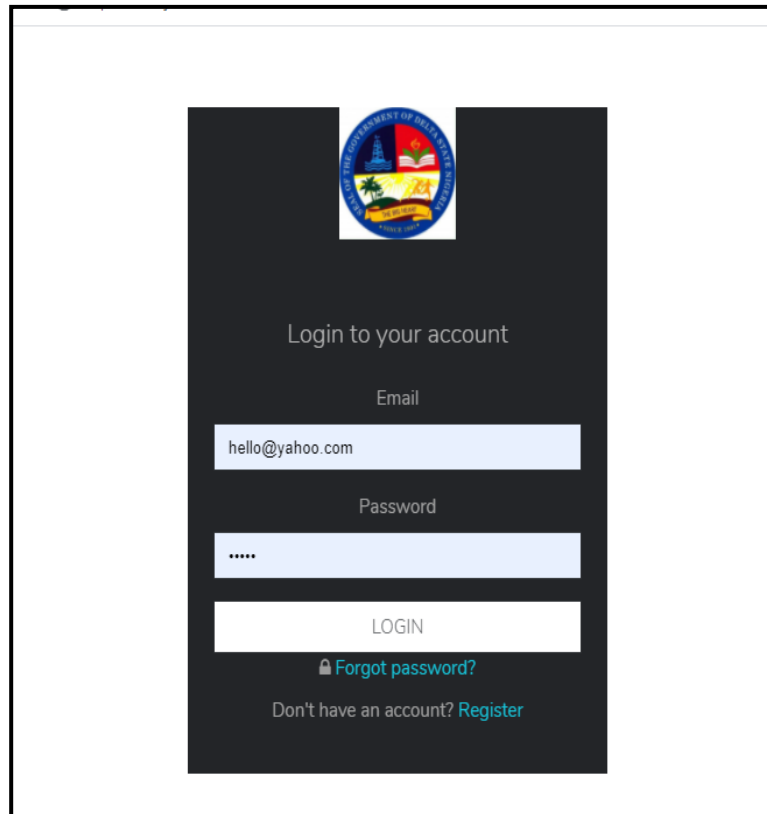


Fig. 3.4: Login Page

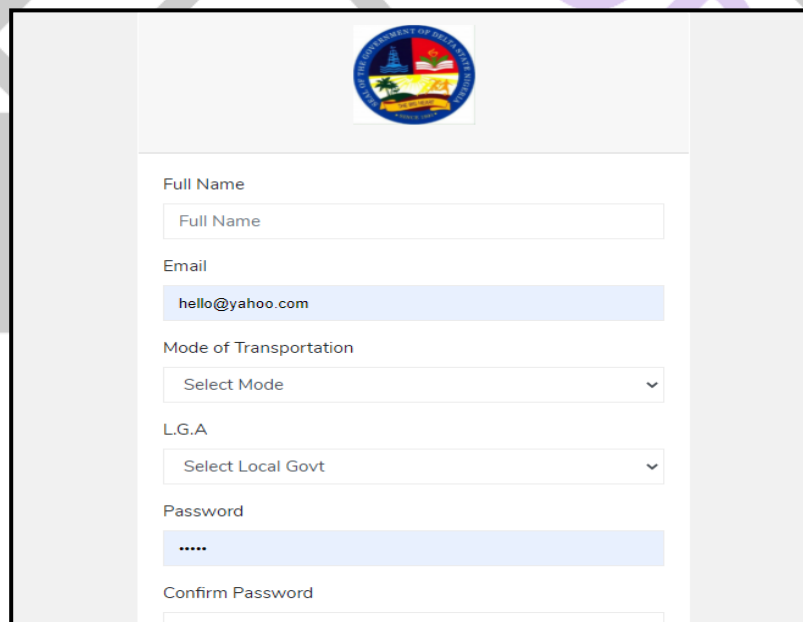


Fig. 3.5: Registration Page

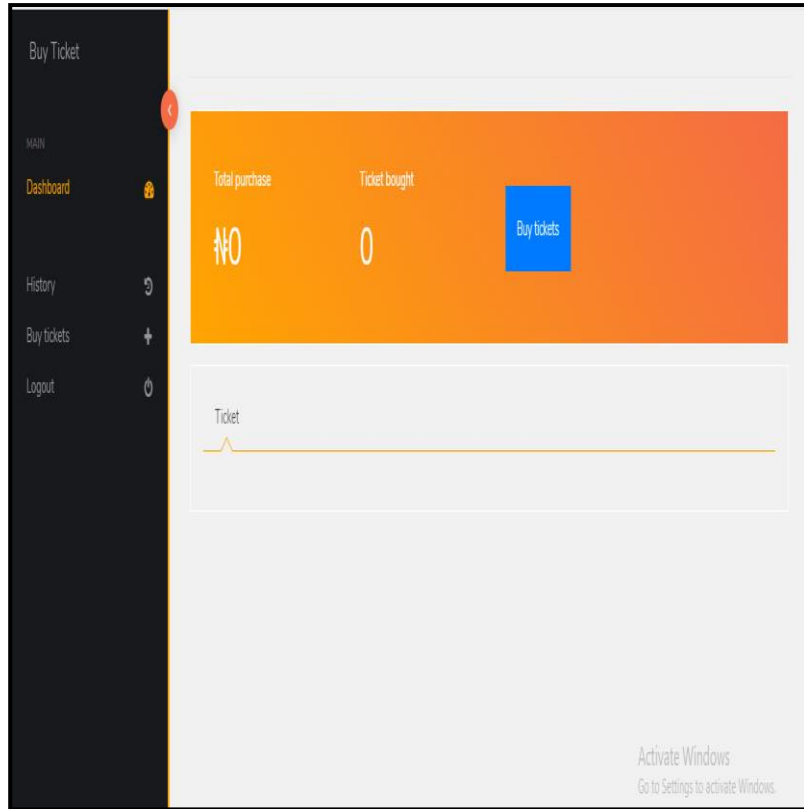


Fig. 3.6: Transporter's Dashboard

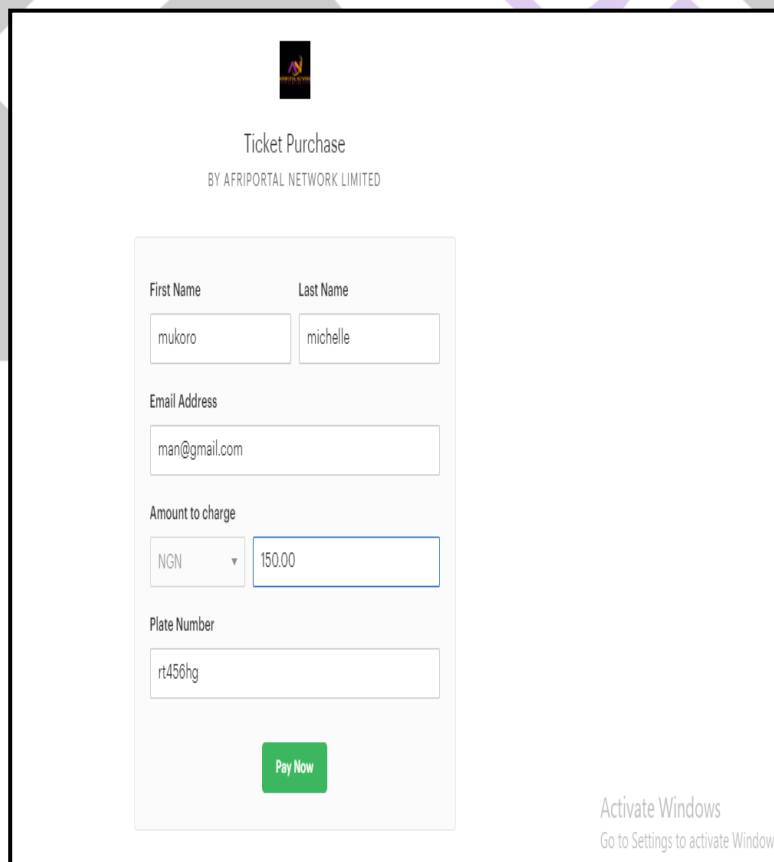


Fig. 3.7: Transporter's Ticket Purchase

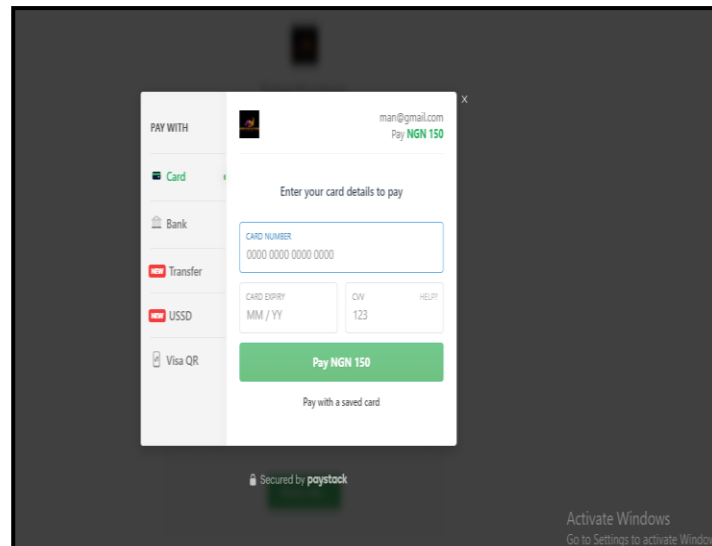


Fig. 3.8: Transporter's Ticket Purchase

4.0 CONCLUSION

As every sector is being affected by the improvement in information and communication technology, it is also expedient that the transportation sector is not left out. It is also a major concern to the government and its citizens of other ways to generate revenue as oil exploration keeps dwindling. This project is aimed at designing a system that will handle daily operational e-tickets for road transporters in order to improve state revenue and reduce the attacks of touts to the road transport sector. In this research we used the object-oriented methodology because of its iterative nature and its ability to reduce risk based on the fact that it will give a prototype that will aid the user suggestion of the software [1].

Data was gathered through questionnaire and interviews from road transporters in some selected Local Government area of Delta State Nigeria and from considering the questions in 1, 2, 3, 6, 8, 10 and the respondent's high percentage; it is evident that an implementation of a system to handle this problem is highly and urgently needed. The system was developed using html, css and javascript for the frontend while php and mySql were used in developing the backend. It is hoped there would be increase in government revenue and ease of generating logs or reports for government future plan for her citizens. This will greatly help to improve the economy and help to automate the taxation in the transport sector.

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