International Journal on Emerging Technologies 11(4): 352-356(2020)

ISSN No. (Print): 0975-8364
ISSN No. (Online): 2249-3255

Online Railway Ticketing System: A Case Study of Kaduna to Abuja Branch of Nigerian Railway Corporation

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(Received 15 May 2020, Revised 25 June 2020, Accepted 07 July 2020)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: Transportation can be referred to as the movement of people, goods, and services from one location to another. This can be achieved through the various modes of transportation i.e. by water, air, road, rail etc. Nowadays, Passenger reservations are carried out with the use of tickets. This study is aimed at developing software which computerizes the processes of acquiring travel ticket at the Nigerian railway corporation. The software is designed to be web-based and has both frontend and backend; the frontend was built with User Interface development frameworks (Bootfaces, Primefaces, and Facelet), the backend was configured with MySQL server (Xampp). Java Programming Language was used to write the underlying codes for communicating between the frontend and the backend. In this study, Document Review and Interview were used as the method of data collection, Waterfall Model was used as the software development model, Data collected were analyzed to design the proposed system and finally, functional software is developed. The software developed was tested with sufficient test data and found to be accurate and consistent.

Keywords: Java, Nigerian Railway Corporation (NRC), Railway Ticketing System, Reservation, Software, Transportation.

I. INTRODUCTION

Railway ticketing system is a software developed to computerize the process of possessing a travel ticket at the Nigerian Railway Corporation (Kaduna to Abuja Branch). The railway corporation as one among the back-bone of the ministry of transport has received a boost in its operating methodology whereby several routes have been revived and put back to use today. However, despite this remarkable achievement, the corporation is still using manual method in generating tickets. Whereby a passenger has to go to the railway stations to book or buy tickets so as to reserve a seat for his journey, this is a problem with the Nigerian Railways that requires attention.

Today, digital computers can be used to facilitate or enhance railway ticket generating processes, simply because computers experienced a very great advancement in hardware technology, but it is obvious that hardware alone cannot confront and solve the problems encountered with the manual railway ticket generating processes. Therefore, software must be developed and install into those systems (computers) in order to find solutions to the problems encountered with the manual railway ticketing processes, particularly in our dear country Nigeria.

This paper presents a software that will computerize railway ticketing processes in Nigeria. The software was designed as web-based. The frontend will be accessed by the clients (passengers) online (globally) to do ticketing while the backend will be handled by an administrator at NRC. However, it will be queried to generate the passenger manifest which contains the total number of traveling passengers at a time. Also, the database keeps track of all the tickets generated with the system.

The rest of this paper is organized as follows: Section I is the introduction which gives the brief overview of what the paper is all about, Section II is the Existing System and Problem Statement, Section III is the methodology used and the system design, Section IV is the discussion and presentation of results, Section V concludes the whole process.

II. EXISTING SYSTEM AND PROBLEM STATEMENT

Tickets are possessed manually at all the Kaduna to Abuja branches of NRC. This means that passengers have to go to the nearest station to them to buy the tickets. This has indeed created a lot of inconveniences on both parties and also leads to lots of misconducts displayed by the said parties.

The problems associated with the current (manual) system of generating ticket at NRC are many, some of which include: -difficulties encountered while booking railway tickets as passenger must visit the railway stations to book or buy tickets, limited time for booking of tickets i.e. between 6am to 6pm only, racketeering

practices, poor financial management and lack of database to aid record keeping purposes.
Apart from the above stated problems, there may be other problems that could be emerged when the new system is put in place. This problem is associated with the maintenance of the software workability, as a result of some software glitches that may be realized from time to time.

III. METHODOLOGY AND SYSTEM DESIGN

The system was developed with the following component tools:
UI Frameworks: Bootfaces, Primefaces and Facelet (JSF) Tags were used to build the frontend of the system, Apache Tomcat was used as the Application server for the system, MySQL Server (XAMPP) was used as the database system used to create the backend application for the system. Java programming language was used as a tool for creating the communication channel between the frontend and backend, Java Database Connectivity (JDBC) which is the interface that establishes the database connectivity via its driver known as J/Connector. However; it serves as an API between the frontend and the backend application.
The use case diagrams below represent how the system works, most importantly, how both the client and admin user interact with the system.

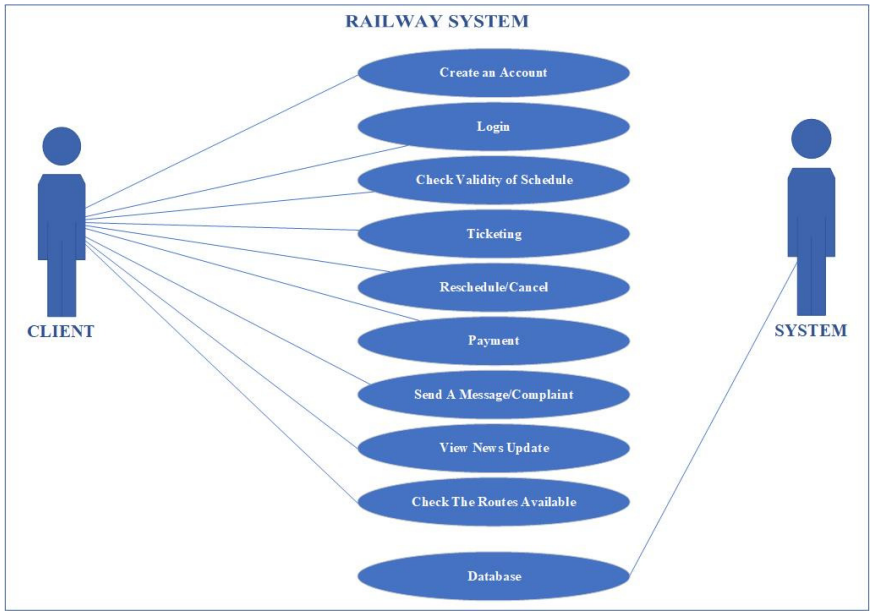

Fig. 1. Use Case Diagram of the system (client user).

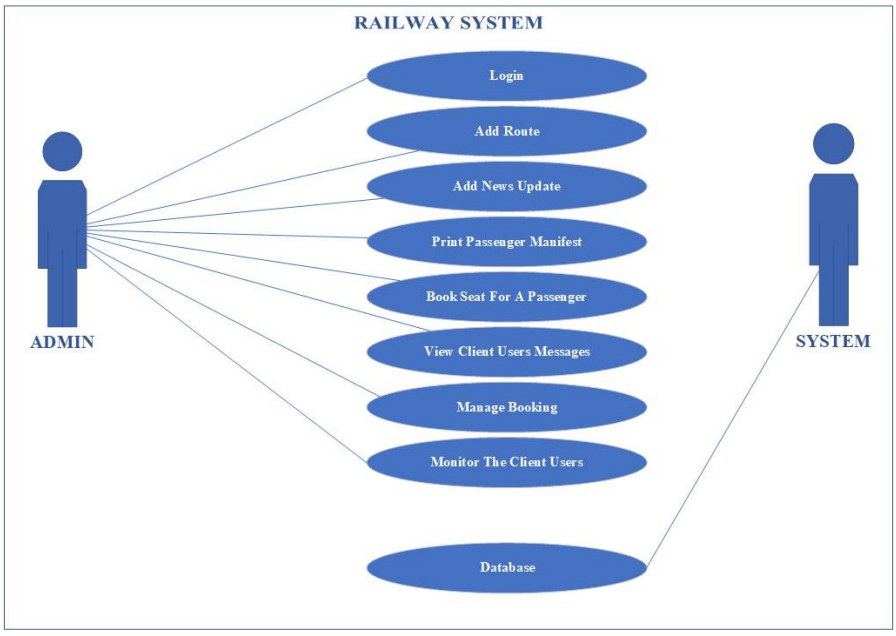

Fig. 2. Use Case Diagram of the system (admin user).

IV. DISCUSSION AND PRESENTATION OF RESULTS

The system starts with the display of home page, which contains the navigation links to the various part of the software. Client user authentication is carried out at Account page while that of admin user is carried out at Admin index page. However, if the authentication details are correct, the user is prompted with various interfaces, user's choice is inclined to what he/she intended to do. The Homepage provides the client and admin user the privilege to select his schedule details.

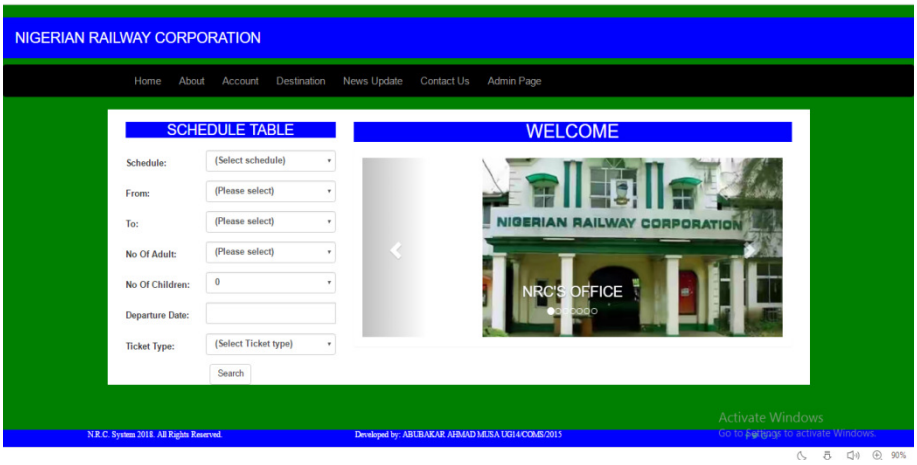

Fig. 3. Home Page.

The next page is the about page which tells more about this software.

Fig. 4. About Page.

The next page is account where the client user is authenticated before he can be granted access to the system.

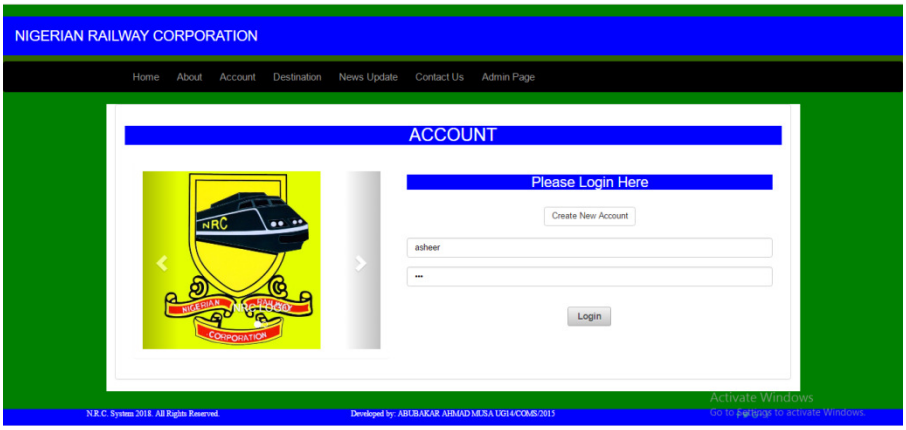

Fig. 5. Account Page.

The next page is the destination which contains information about the routes available and their respective details.

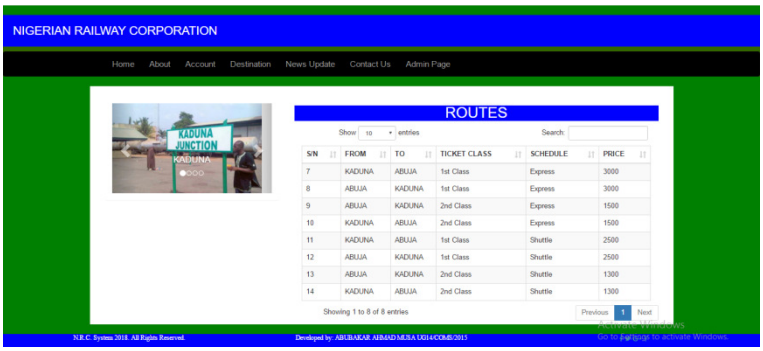

Fig. 6. Available Travelling Routes Page.

Below is the page where a client user can send a message to the corporation.

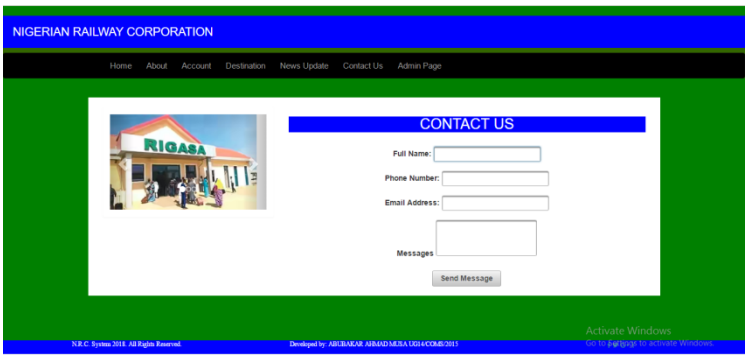

Fig. 7. Contact Us Page.

Moving to the Admin User Section, below is the page where admin user is authenticated before he is given access to the system.

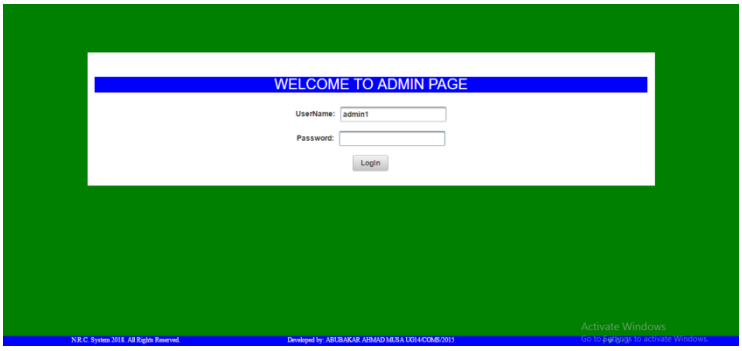

Fig. 8. Admin Index Page.

Below is the page where the admin user can update the client users with news and availale routes update.

Fig. 9. Admin Main Page.

Below is the page where the admin user views messages from the client users.

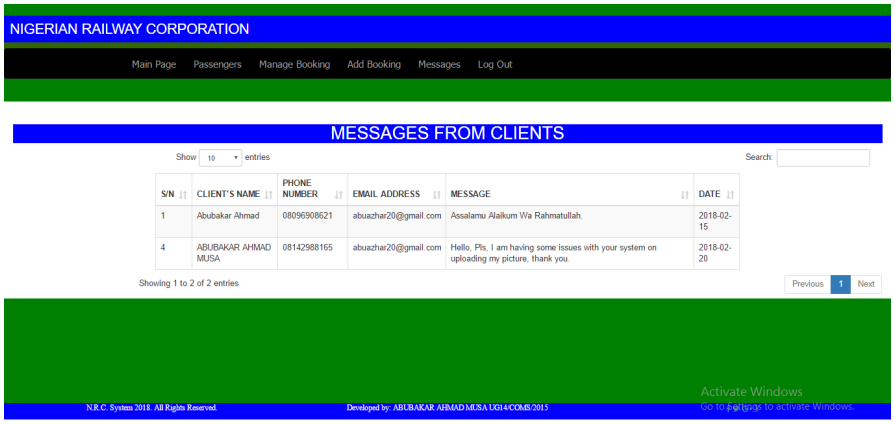

Fig. 10. Admin Messages Page.

V. CONCLUSION

This study was conducted with the sole aim of advancing knowledge and developing software for a railway industry which is to be used by the staff of the industry for speedy and efficient services.

The history of rail transport in the world began in the 6th century BC in Ancient Greece, while computerization of railway ticketing and reservation services has been in existence since the late 60s when generating handwritten tickets became laborious and as well obsolete.

Many computers were developed and used in this regard especially in developing countries like India etc. More recently, a number of sophisticated real-time software were developed for the computerization of railway services, a good example is a software developed at the end of this study.

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How to cite this article: Musa, A. A., Abdullahi, A., Abubakar, B. S. and Varshney, S. (2020). Online Railway Ticketing System: A Case Study of Kaduna to Abuja Branch of Nigerian Railway Corporation. *International Journal on Emerging Technologies*, *11*(4): 352–356.