An Online Road Transport Booking System

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Abstract - Road transportation bookings have traditionally been done over the counter in transportation terminals but with the exponential growth of e-commerce, this has changed. This study focuses on automating the Road Transport Booking System to allow travellers (passengers) and employees to buy and sell tickets online. The study also discusses issues that consumers and administrators face, such as long wait times to book a trip, unsafe environments and more. The project investigates several implementation problems and makes suggestions about how to successfully incorporate an Online Road Transport Booking System. This web portal would aid future development of a fully integrated system that connects transportation company employees to consumers, employees to employees, employees to other types of transportation providers, employees to companies, and employees to government agencies. The development tools used in the development of this research are PHP, CSS, HTML, JavaScript, MYSQL database, and XAMPP server.
Keywords: Road Transport, Online booking system, Ticket, Web portal, Transport Company

I. INTRODUCTION

Transport implies the movement of individuals or merchandise from one point to another through various mediums such as cars, trains, airplanes and even animals such as donkeys, camels etc. It can be characterized into three different types based on the surface they travel. The diverse modes include water (shipping), air and land (road, pipeline and rail). Transportation was available before the inception of the modern means of transportation which are traditional means [1]. Such traditional means include the human powered transport which utilizes the human muscle-power for walking and running. Although some of these methods are still in use today for short distance travel, the human-power has greatly been improved with modern technologies. Human-powered transport remains popular for reasons of relaxation and physical exercise. In spite of the fact that people are able to move around without any infrastructure modern transportation is also a necessity. Transport investments can be quite huge and transformative, leading or accompanying structural change [2]. Transport can be improved through the utilization of roads, particularly when utilizing the human-power with vehicles, such as bikes and cars. Our society has over time experienced a period of transport infrastructure expansion

[3]. Transport systems are to be managed to favour higher value trips [4] and road transport tends to connect people more. The road transport booking system is an electronic system that allows customers to have access to travel tickets by buying the transport tickets, check available seats, pick departure date and so on. Reference [5] indicated that transport booking in the offline era posed different troubles to the clients as well as the transport administrators. According to [6], offline ticket booking reduced the scope of customers to choose different options based on their travel criterion [7]. Prior to the advancement of Road Transport Booking System, road transport never utilized any framework to keep records of booking, but rather, records of booking and storage of transport data where hand-written. This practice has led to time wastage when storing data, insecurity of data, delay in accessing data and reiteration of uniform data records due to staff's inability to recover the list of documents and exchange made in past. To alleviate the above lacuna and thus achieving better data storage and booking there is a need for an online Road Transport Booking System that can also provide good user experience and usability. This study aims to develop a web-based transport booking system that would replace the traditional means of operation, improve on the existing system and also satisfy the facilitation of all transactions online with effectiveness.

II. ROAD NETWORK PATTERN AND ANALYSIS

Road network comprises of huge number of joined roads showing numerous patterns extending from star-like to grid-like with sporadic patterns getting to be recognized [8]. It comprises of sizeable number of roads that are intertwined with each other to show patterns. The recurrence of such patterns warrants development of prototypical views of topographical processes [9]. According to, [10], the route network is a collection of nodes representing topological areas and shows topological and geometric modifications, whereas topology itself alludes to the arrangement and association of nodes and links of a network. The route network is made up of secondary and primary roads called minor and arterial roads accordingly. Road network constitutes a significant component in urban growth as roads give access required by distinctive land uses and the

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right operation of such urban zones relies on effective transport network, which is the main reason for their very existence [11]. Analyzing the road networks has to do with recognizing the pattern and qualities of the roads. Reference [12] considered the view of events as objects and contended that patterns themselves are objects confined in space, arranged in order, and distinguishable by a set of unique qualities. The qualities can be stressed through the method of abstraction and representation where pattern is seen as complexes of ancient objects and the relationship between them. This gives the structure, degree, arrangement, thickness, topology and setup as their inherent properties. Topology, as stated by [13], is a course of action and connection of nodes and links of measuring the solid structure whereas configuration alludes to a collection of entities that contain the model of road networks.

III. THE PROPOSED SYSTEM MODEL

After conducting a review of the current models and identifying its flaws, we considered the possibility of implementing an advanced, reliable, and competitive system to incorporate a web-based road transportation booking system. The system's architecture and implementation are straightforward. The framework only uses a limited amount of system resources and can be used in virtually any configuration. It has the following characteristics: (a) Ensures the accuracy of data. (b) The database efficiently maintains all records. (c) Anyone with access to the internet anywhere in the world can use this service. (d) Bookings cannot be cancelled for different processing; a minimum amount of time is needed. (e) Better service. (f) The organization is encouraged to effectively manage and coordinate its schedules based on traffic demand. (g) Optimization of available manpower.

The proposed model is a two-tier architecture which comprises the backend and frontend as shown in the following Figure 1.

1. Backend: The backend consists of an online relational database which is used to store road transportation booking processes for further use and also ensures accuracy of data whereby encouraging road transport organization to effectively manage and coordinate its schedules based on traffic demand.

2. Frontend: The frontend consists of the web application which display the admin and customers view such as home page module, login module, staff management module, bus information module, purchasing, news module, registration module, booking module, payment module, and ticket module.
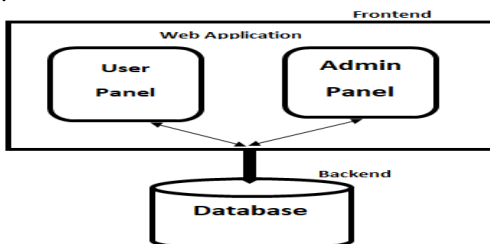

Fig. 1 The Online Road Transport Booking Model

A. Use Case Diagrams for the System

The following Figure 2 illustrates the use case diagram the online transport web-based booking system. The attempts to capture the major functionality expected to be available to the user as he or she uses the system.
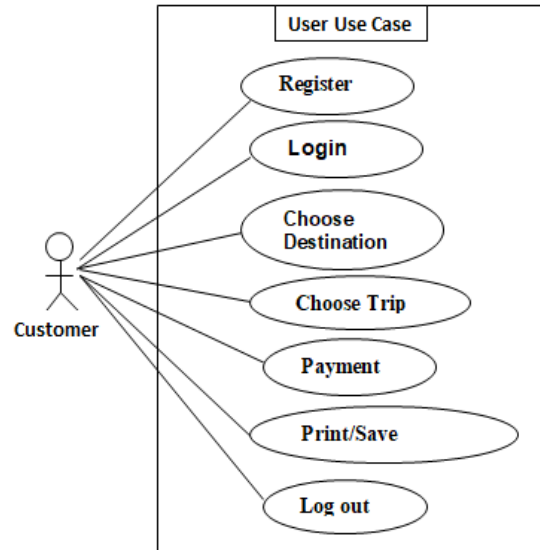

Fig. 2 User use-case diagram

The following Figure 3 is the use case for admin showing the analysis of major interactions of the essential features expected of the system design.
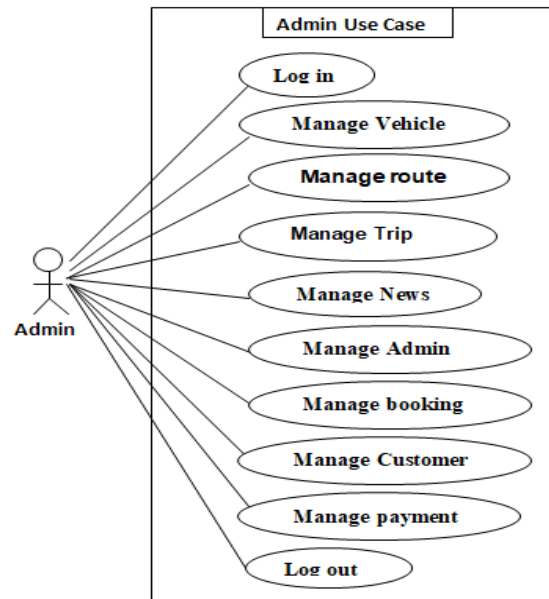

Fig. 3 Admin use-case diagram

B. Activity Diagrams for the System Design

The following Figure 4 depicts the user activity diagram for the system design. This represents dynamic behavior of the system showing the flow of activities as the user interacts with the online road transport booking system.
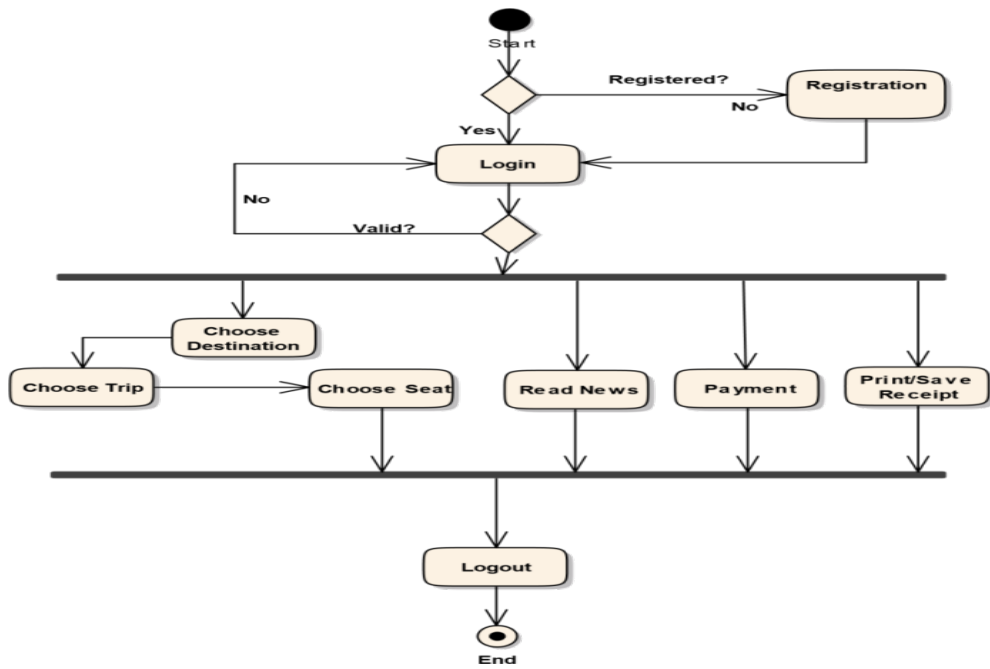
Fig. 4 User activity diagram

The following admin activity diagram (Figure 5) is the schematic depictions of workflows as the administrator interacts with the system. This is the dynamic view of what takes place within the system design; the small filled-in circle represents the start state of activity while the solid filled-in encircled black circle represents final state.
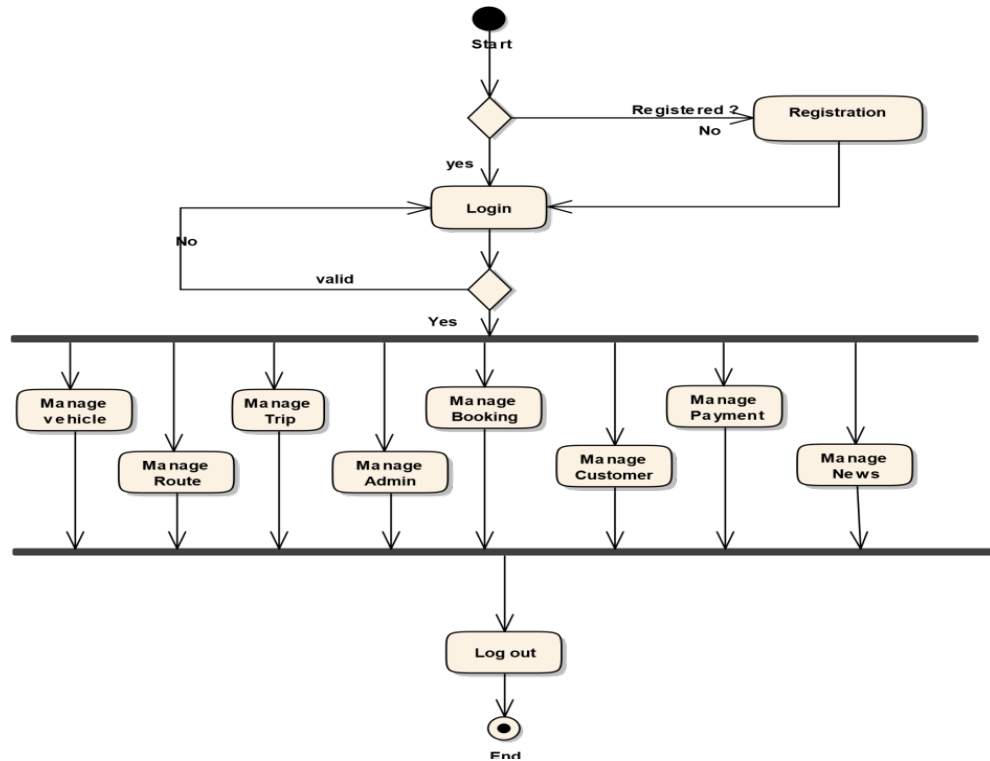

Fig. 5 Admin activity diagram

C. Sequence Diagrams for the System Design

The sequence diagram presents the flow of messages through the system. It aids in the visualization of a variety of complex scenarios. The following Figure 6 is the sequence diagram for the user use case design showing flow of messages within the system.
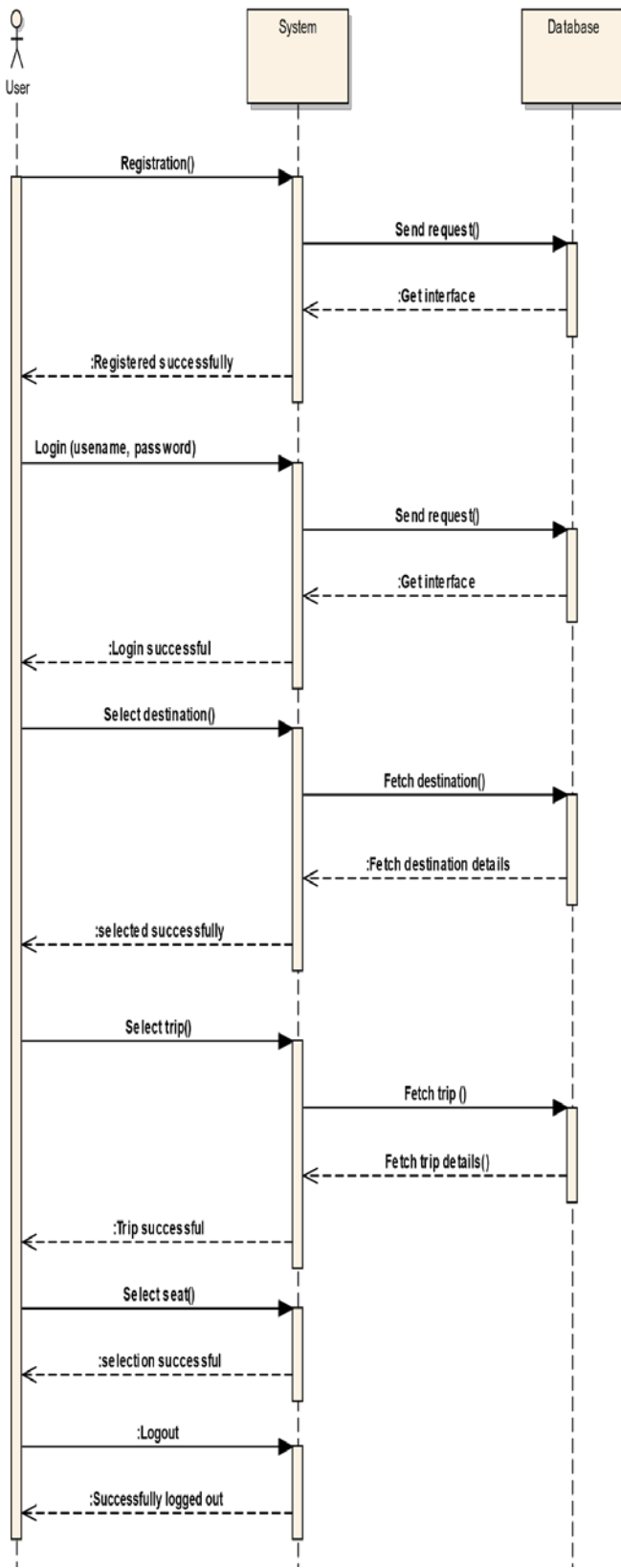
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Fig. 6 User sequence Diagram for the system Model

Fig. 7 Admin Sequence Diagram

The flowing Figure 7 also presents the Sequence diagram for the admin use case. This also modeled the flow of messages for the admin.
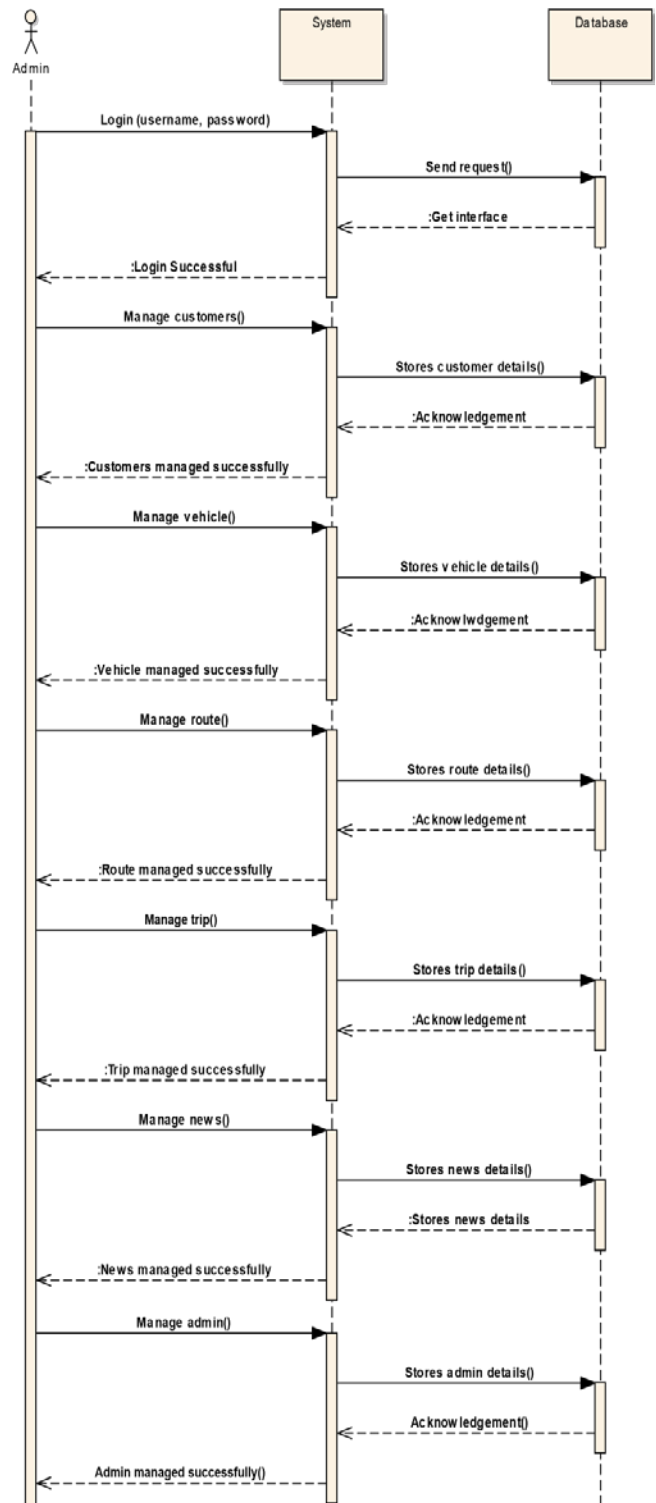
IV. IMPLEMENTATION AND OUTPUT

Figures 8 and 9 show the screen shots of where the consumer can book for a trip. Customers can also select their preferred seat number. Only seats that are available are the ones which seat numbers are displayed on the seat selection menu. Only an authenticated person can access this page.
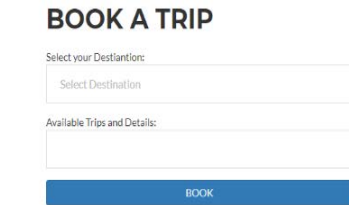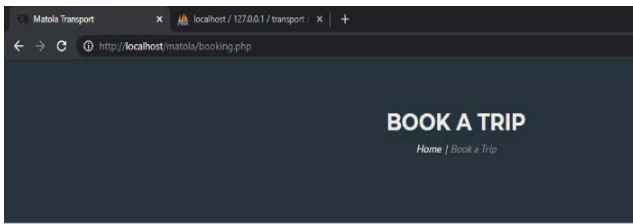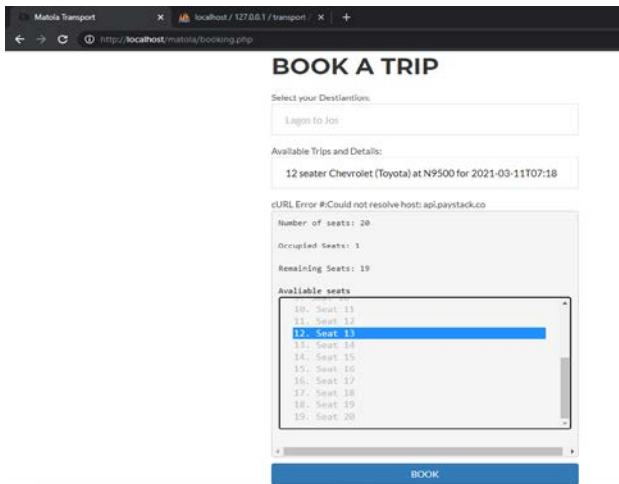
Fig. 8 Booking page

Fig. 9 Booking page

The following Figure 10 shows the admin home page. The admin can select which operation he/she intends to do at any point in time.
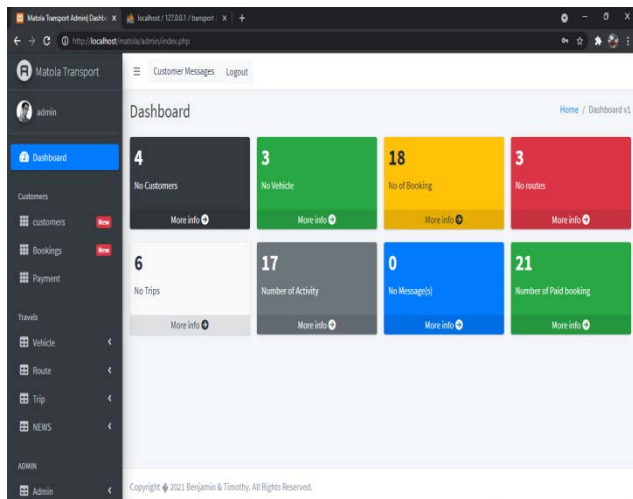

Fig. 10 Admin home page

V. IMPLEMENTATION AND CONCLUSION

The online road transportation ticketing system web portal was designed to make booking seamless for passengers and as such this has removed a lot of bottlenecks in terms of ticketing. The system design was also able to achieve some non-functional requirements like usability and user experience. Physical booking points and some online systems where investigated then improvement were featured in the designed road transport booking system. Consumers and business owners of road transport systems can enjoy smoother interaction and better dealings as far as the system design is concerned. The use of a web-based method brings many advantages, in particular, the possibility of accessing information everywhere and at any time of the day. Further direction is to extend the admin task to cover more maintenance routines like analytical tools as well as the introduction of data mining techniques to aid decision making processes.

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