



# Online Bus Monitoring and Reservation Application (OBMRA) for GL Trans Agency

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**Abstract**— Online bus tracking and reservation applications an application for mobile devices that functions on a centralized network. The software application "Online bus monitoring and reservation application" provides a bus transportation system, the opportunity to book seats, the cancellation of tickets, and a variety of inquiries needing prompt and swift reservations. Online bus reservation and monitoring apps are intended to facilitate the management and computerization of traditional databases and the booking, tracking, and monitoring of buses and travel. It allows workers to check ticket availability and make reservations for specific clients. It maintains all user data, including bus, reservation, booking, and customer data.

**Keywords**— Online reservation; Application reservation; booking system

## I. INTRODUCTION

GL Transit Agencies is a privately owned domestic transportation firm that operates buses in the cordillera region. They have multiple branches in various areas throughout the region to facilitate intercity mobility. They desire the development of an internet application where the details of bookings and customers are regularly updated and where one can immediately track the details of available seats. Customers must approach the counter to purchase a bus ticket or inquire about the schedule. When purchasing bus tickets, customers are required to pay in cash and sometimes may wait in line for hours to obtain them. In addition, consumers are prohibited from purchasing bus tickets by telephone because the bus company's phone line is always busy. GL Transit Agencies is the organization that provides consumers with transportation services based on their needs. They offer many types of buses, including air-conditioned, luxury, and standard. Different buses have different pricing structures. The rates also vary based on the distance the consumer wishes to go and the customer's status.

Students will receive a 10% discount, while elderly people will receive a similar discount. Age is irrelevant to the agencies' policies. They employ this strategy to attract clients. They maintain all of the bus

reservation counter's records offline, and only the Administrator and Employers have access to them. As the service is provided throughout the region, tracking the details of the reservations made takes work. As a result, tickets are only issued on the buses themselves. Researchers attempted to address the gaps.

This project intended to alleviate the deficiencies by integrating an online busreservation-monitoring program for GL Trans Agencies. The outcome of this study can be beneficial for offline services that track booking information.

## II. RELATED LITERATURE

**"Factors Affecting Online Bus Ticket Reservation."** As progress develops, PC-based service applications are promoted to intranet-based services, and the rapid adoption of web technology has changed everything into cyber-based applications accessible virtually, internationally, and on-demand over the internet. What is new is the capacity to scale services rapidly; this paradigm shift in service provisioning affects the deployment of real-time applications. According to this study on online ticketing, each component should be investigated for the lucrative prospects that cyber applications reveal. Results identified

on-demand, cashless, and one-to-one privacy determinants as keenness variables, less costly, specific circumstances, and time-saving as acceptability factors. This study would help cyber-based service providers satisfy the requirements posed by the expanding scope of their services (Marfo & Quansah, 2020; Bagrecha & Alam, 2016).

#### **"Online Bus Reservations and Electronic Commerce."**

The goal was to ensure that the consumer did not have to leave their comfort zone to book a ticket and to assist them in obtaining a ticket when they needed one. People voted for the internet as the medium they could not live without. PC and Internet penetration increased not just in urban but also in rural areas. Additionally, individuals were becoming accustomed to ordering trip tickets through 2GO and private airline websites. Why then not Buses? The online bus reservation system allows customers to make online bus ticket bookings, check bus availability, and amend their profiles while the administrator can update, delete, and examine information. After making a reservation, customers can purchase tickets and make payments online, eliminating the need to pay at the counter (Adducul, 2020).

**MBTS stands for "mobile-based application for bus ticketing services."** Mobile technology is a feasible option for generating applications for our activities. This concept recommended utilizing such technology for MARA Liner ticket bookings to make this service accessible anytime and from any location. This study's primary purpose is to create and assess a mobile-based Bus Ticketing Services prototype (MBTS). This study intends to provide bus transportation firms with effective WAP technology utilization. The literature on mobile technology and its elements has been discussed to establish a foundation of knowledge for such mobile technology. This research will direct the prototype's development and evaluation. The adopted technique consists of four steps: Information Gathering, Prototype Design, Prototype Development, and Evaluation. The findings of user evaluations of the MBTS suggest its usefulness in terms of Usefulness, Ease of Use and Outcome, and Future Application. For Usefulness Outcome/Future Use, the results revealed a significant difference between the first group of users with a mobile phone and the second group without a mobile phone, but there was no significant difference in Usefulness and Ease of Use (Ali Akounni, 2009; Asaad et al., 2013).

**"The RedBus Route to Success in the Indian Market: The Development of Online Bus Ticketing."** Despite being utilized by millions of people, the bus travel sector in India is very fragmented and unorganized, and it took some time for innovations to emerge in the Indian bus ticketing industry. This research seeks to investigate and

assess the scope and impact of the transition by focusing on redbus, the largest bus ticketing company in India. The first half of this paper analyzes the characteristics of the Indian bus transport sector and its issues. The second component of this report lists the obstacles faced by 'redBus,' which currently covers 80 percent of the market geographically. This research then investigates an existing growth model for 'redbus' that would give long-term growth sustainability (Thomas et al., 2014; Srivastava, 2020).

#### **STATEMENT OF OBJECTIVES**

1. Measure application's overall convenience, effectiveness, and user-friendliness.
2. Determined the quality of fetched information and management of data fetch in the system application.
3. Determined the interface quality (the application contains all the functions and capabilities of the interface.)
4. Measured the acceptability of the application.

### **III. METHODOLOGY**

Before proposing an OBMRA, the researchers interviewed the GL Agencies to discuss the existing offline booking service. In addition to the interview, the agency would like to include an online bus monitoring and reservation system that would allow them to keep track of bus records and consumer information.

The study utilized OBMRA, which enables customers to book tickets by visiting booking counters in their vicinity (near the respective location) as needed. As it is an online application, the client desires that the application be linked to the database so that any information provided, including information about customers, buses, and bookings, may be viewed by other centers. They would also like to include a feature that accomplishes their responsibilities and an application that allows customers to access the website and order tickets online rather than at the counter. It is necessary to keep a database including the bus specifics, bus number, and route, stops it makes along the distance, and departure and arrival times. In addition, the client information entered at the time of ticket purchase must be added to the database so that they can track the customer's details at any moment utilizing the transaction code-based search option (Asaad et al., 2013).

Employers are the only ones who may book tickets using a username and password. Hence, the database should also have a list of companies. The list to be maintained consists of personal information, contact information, name, and location/address. There must be

buttons such as delete, edit, and straightforward. Depending on the selected button, the appropriate action must be taken. Also, if the Employee record is submitted (The Employee data will be kept only by the Admin), the system will request the Employee's login and password (the Employee can change the password) so that he can log in to the account and complete the booking chores. In addition, there is a time limit for ticket cancellation. If canceled before 3 pm, the reservation is null and invalid (Dennis et al., 2015; Gordon, 2016).

This action must also be performed solely by the application. They want the application to be maintained in many details, such as booking and transportation information. When a consumer attempts to book a ticket, they should be prompted to provide information about themselves, such as their name, the day and time, the location of departure, and the destination. Additionally, the bus number and seat number for which the ticket(s) are booked must be entered so that they can keep track of the reservations. When a consumer inquires about availability, they can use the Enquiry form, which requests information such as Destination Place, Starting Place, Date, and Time. These details should be entered to see the availability details (all fields are not mandatory). In addition, a search tool should provide easy access to the customers' and buses' records using the same criteria as the abovementioned alternatives. One should be able to print the ticket, which should include facts such as the name, date, and time for which the ticket was booked, the destination and starting locations, and the fare. The program should be capable of calculating compensation according to the criteria and distance. Additionally, it must be updated on the website.

#### Note

*Reserve the ticket or obtain the information (Search and Enquiry). Only once they have successfully logged in will they be able to do such acts. This application is maintained only by the booking department, which uses it to book tickets. It does not apply to customers who cannot order the tickets online. The administrator maintains a list of both the buses and the employees. Only the Employee can modify his password via the booking window.*

#### NON-FINANCIAL

It was necessary to design a web application to be used and maintained exclusively by the booking department (regarding the bookings like booking, Enquiry, and Updating and canceling). It is used to automate the procedure. In addition, the Admin (Employees, Buses, and fees) has complete authority. Also, users must log in with their allotted username and password to make a reservation

or do other tasks. New, update, cancel, and search buttons will be present on each page containing employee information. The customer was required to visit the booking office to inquire about or purchase tickets, and he may collect them on the bus by himself. In addition, it maintains a database including a list of buses and the transaction code assigned to each bus for quick reference. There will be an Enquiry form, a Booking Form, and a page containing the search choices. In addition, a separate Price list must be maintained, from which one may get price details by entering the origin and destination, age, number of seats, etc. The prices are based on category, bus type, and distance, and the booking staff is responsible for keeping track of them.

#### FINANCIAL

Charges vary based on the type of bus selected, the distance traveled, and the customer's age, which is determined by the booking staff at the booking office. The Admin can only modify the price list. In addition, the Admin will determine the Reimbursement amount and calculate it by the booking office based on the abovementioned factors.

#### FUNCTIONAL REQUIREMENTS

Only the (Manager) Admin is responsible for maintaining and controlling the details of the buses, price list, and employees. The employer can reset his password independently. In addition, the employer had to check in to complete the booking steps. Calculations of charges and refunds are to be carried out by Booking staff designated by Administration. The available bus and seat information must be preserved and can be periodically updated (of course only by the Admin). The inquiry form, Booking form, and price list at the booking office will be kept on different pages. New, revised, canceled, and searched reservations should be accessible through the booking office.

#### USER INTERFACE DESIGN

The following figures show the different interfaces of the OBRMA (Online Bus Monitoring and Reservation Application).

##### 1. Home UI



Fig.1.1 Main Page

2. Admin UI



Fig. 2.1 Admin login



Fig.2.2 Admin dashboard

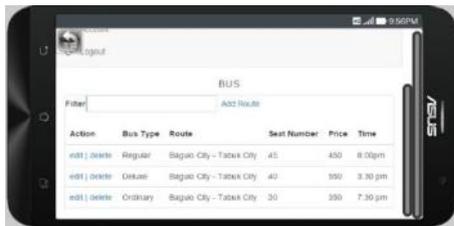


Fig.2.3Admin bus route

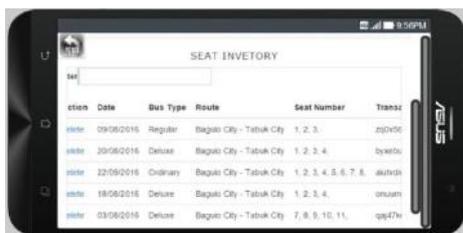


Fig.2.4Admin inventory seat



Fig.2.5 Admin manages the account.

3. User UI

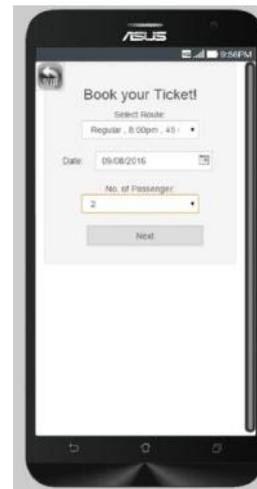


Fig.3.1 Book ticket



Fig.3.2 Customer detailed form with cache

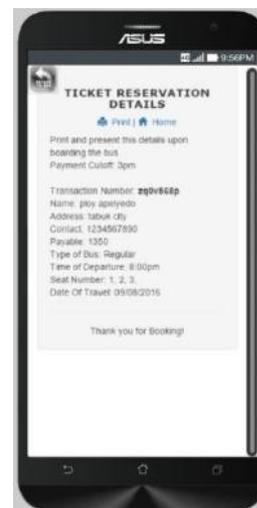


Fig.3.3 Customer confirmation detail

**TESTING**

The researchers tested the application in **Intel XDK**, a development kit created by Intel to create native apps for mobile phones and tablets using web technologies like HTML5, CSS, and JavaScript. Apps are compiled online via the Cordova platform for making cross-platform apps. It is free for Windows, O X, and Linux (32-bit and 64-bit). The kit allows a developer to compile the exact solution to different platforms, thus reducing the amount of code required to ship a cross-platform product.

The application is posted to Google's digital distribution service Android Google Play, which is operated and created by Google. It functions as the application's official app store, allowing users to browse and download OBRMA applications built with the Android APK.

The application's downloadable Android Application Package (APK) is used to test the application with a survey questionnaire for the user and Admin. Upon using the application, the survey question is evaluated such:

**Measuring the application efficiency**-of overall convenience, effectiveness, and user-friendliness of the application.  
**Measuring quality information**-quality of fetched information and management of data fetch in the system application.  
**Measuring the interface quality**-the application contains all the functions and capabilities of the interface(Dumas et al., 1999; Pai et al., 2003).

Usability and quality are not single, unidimensional characteristics of a product, system, or user interface; this must be understood. Usability and quality are determined by several criteria, including, Intuitive design: an almost effortless comprehension of the site's architecture and navigation. How quickly can a person who has never seen the user interface? do fundamental activities? The velocity with which an experienced user can complete activities. Memorability: after browsing the site, a user's ability to recall enough information to use it effectively on subsequent visits. How frequently users make errors when using the system, how severe the faults are, and how users recover from them. Subjective fulfillment: If the user enjoys using the system(Dumas et al., 1999).

**EXPERIENCES**

Online bus monitoring and reservation application run on 25 users/passengers with android mobile phones, including the booking personnel. This experience validates the affectivity of usage of the user as well as the booking personnel in the application. Generally, the experiences were positive even for people with no prior mobile android

phone experiences. However, the experiences did reveal some rough edges and limitations of the applications. We describe the main findings below, based on informal surveys of our users. The following section presents results from controlled experiments.

Twenty-five users have been using the application for two days. We did advertise the application for awareness/existence. Seventeen users have prior knowledge of android applications and use a minimum android platform mobile OS. Beyond providing the application's APK (Android Application Package) and guide manual, we did not assist the user in managing the application. At first, users have difficulty installing the application for having an unstable internet connection.

Given half an hour, users can understand the features of the apps. What our users found most in the application is the user-friendliness of the application. Most users can use the application quickly and simply because of the sequence of process tasks using the application. Interfaces are simple; the application has all the functions and capabilities expected from the manual and document proposed.

**DIAGNOSTIC SUPPORT IN INTEROPERABILITY OF THE APPLICATION**

On the negative side, three mobile phones have a deployment problem. For instance, when applications that use a lower model of android devices/or support a lower android Operating System behaved unexpectedly, users could not quickly tell if it was due to program bugs, device malfunctions, or poor signal strength to the device. Disambiguation requires effort and technical expertise. (e.g., loading of the interface from old model devices).

**EVALUATION**

In this section, the researchers showed how acceptable the application is to users as of efficiency, quality of information, and interface, and based on their responses, the developers can already identify the acceptability of the OBRMA (Online Bus Monitoring and Reservation Application).

*Table 1. Application Efficiency*

Item Number	Weighted Mean
Q1	4.45
Q2	4.35
Q3	4.50
Q4	4.45
Q5	4.55
Q6	4.55
<b>Average Weighted Mean</b>	<b>4.48</b>

**Table 1** describes the efficiency of the application users tried to use and evaluates its efficiency. As shown below, the average weighted mean of efficiency is **4.48**.

**Table 2** shows how the mobile application responds to the quality of information. Based on the users' responses, the average weighted mean is **4.46**.

Table 2. Information Quality

Item Number	Weighted Mean
Q1	4.60
Q2	4.76
Q3	4.80
Q4	4.55
Q5	4.50
Q6	4.60
<b>Average Weighted Mean</b>	<b>4.64</b>

Table 3. Interface Quality

Item Number	Weighted Mean
Q1	4.60
Q2	4.50
Q3	4.70
<b>Average Weighted Mean</b>	<b>4.60</b>

As a mobile application, the developers should always consider the quality of the interface. The below shows how the users appreciated the quality of the interface. Having the average weighted mean of **4.60** is already a manifestation that the users enjoy and strongly agree with.

Table 4. Evaluation Summary

Areas	Users
Application Efficiency	<b>4.48</b>
Information Quality	<b>4.64</b>
Interface Quality	<b>4.60</b>
Acceptability	<b>4.57</b>

As shown above, the users' acceptability is 4.57, or 22 out of 25 strongly agree on the quality and efficiency of the OBRMA (Online Bus Monitoring and Reservation Application).

#### IV. CONCLUSION

Online bus monitoring and reservation for GL Trans Agency gave users the ability and assurance of reserving tickets at school, office, or home at their most convenient time and advancing the agency's capability to

monitor and, if needed, add additional trips ahead of time. The task of managing and extending technology in booking a reservation and tracking busses online bus monitoring and reservation application provides a simple process for fetching information on bus monitoring and reservation from a passenger and overcoming difficulties and problems that arose in the manual system. Further, the researchers recommend that the agency should be able to have a strong internet as well as data connection of the clients; and the Verification of other IT experts from the concerned agency.

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