



BEng. (Hons) Software Engineering

PROJECT PROPOSAL

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Project Title:

Web Based Online Bus Booking and Tracking System for
HATHIF Passenger Transport Services Pvt.Ltd

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Abstract

It is very important to maintain efficient software to handle bus booking services in every place. This application provides a way to record the information and to access them in a simple way. The report presents the implementing details about web based online bus booking service system for HATHIF Passenger bus services. In many centers, they do their all process manually. For example recording information, process, maintain their information, etc. Hence passengers have to come to the center at Colombo, even they are from far. Due to this purpose, it's waste of both time and money of passengers.

To overcome those drawbacks our aim is to design self-sufficient software, web based online bus booking services system. The application must be extendable, easily maintainable, cost effective, robust, user friendly and errorless. The system is implementing using web base technology. The system is able track the location also. It is implemented using Android system. The system access is given according to their level of control to users such as administrator, System staffs, employees including conductor and passengers etc. There is able to do number of process such as validate User Login, analysis available seat, calculate total ticket price, generate bus ticket, analysis passenger data, generate admin report, etc. The customers should input their details such as available bus, available seat, receiving confirmation sms, print ticket, bus location, admin report, etc. The user will get a confirmation message when they complete their booking and payment.

The system presents additional features including generating reports as well. These reports included analyze and design of the system and also it emphasize how important these kind of system. This system could be implemented easily among the people.

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1. Introduction

I insist to do an online bus booking system as my 3rd year project because Sri Lanka's transportation has so many interrogations. It doesn't have any time schedules or proper services. Normally HATHIF Passenger bus services have manual bus booking system. Therefore it is not possible to do a bus booking at any time of the day (24 hours). Usually when we are booking our tickets, we need to go to the Central Bus Station in Colombo. So it is a waste of time and money. Most of the time after we booked our tickets if there is road traffic; we won't be getting informed about the traffic. Due to traffic or breakdown of the bus we should stand until the particular bus come. These kinds of delays and problems really affect our value of time throughout our daily routines, work, and emergencies. The lack of time may cause many problems. Here I am suggesting web based online booking and tracking system to address and overcome all the above problems. In this system you can complete a booking at any time of the day (24 hours). And the passengers can book their tickets with free of charge for booking from the place where they are. The passengers will be informed whenever there is a breakdown and they can track the location of the bus. I am using web based technology (PHP, HTML, CSS, jQuery, Apache) and SMS gateway to develop the system. This is the most reliable and efficient solution for bus booking services. I am sure the introduction of this system will be a great solution for all those demands.

2. Background and Motivation

In HATHIF Passenger bus services there are luxury buses. I have always travelled so many places therefore I have felt all the inconvenience in travelling. When I was in Mannar, I wanted to go urgently to my home at Anuradhapura. But I was working therefore I couldn't go to bus station to book my ticket. Consequently, I asked an excuse from manager and reserved my seat ticket. After that I was off at my work and I was standing at bus stand from 6 to 7'o clock. It was a tragedy. And I got home at 10.00 pm. It really made me to think why I should stand there for 1 hour without knowing the exact time the bus would arrive and how could I reserve a seat for such a long distance journey from the place where I am. I have seen most of the people facing these problems. So it motivated me to choose a project such as online bus booking. Online bus booking is really efficient and reliable because people are busy through their work therefore they can't waste their time by going to the place where they book bus tickets. So online booking is suitable for all of them to get into the bus from the place where they are. If you're already reserve your seats and tickets you will be mentally relieved. You can even select your seat as your wish. Mostly women really need safety and comfort. They could even travel during night without fear. You don't need to wait standing at the bus stand for long time at day or night. Patients and handicaps could travel safely. And we don't need to be tensed when bus will arrive to our place because the android system will help us by giving alert to us. You can even checkout the location status through internet. Online system will make regulations. Pursuit of online bookings will begin to make people feel safety and comfort. It was difficult for commuters to travel to distant places without break into at one or two destinations. But now our system will produce a verdict for above problems. But the main reason I intent to select this project was making time schedules and night time services. I can truly argue that online bus services will make a revolution.

3. Problem in Brief

Tragedy of travelling – solution with online booking If I would briefly explain about the problem domain I am going to address, I would say that there aren't any time schedules, proper services and night time services in bus transportation. Therefore online bus booking services will make travelers comfortable and efficient with their money and time.

4. Aim & Objectives

4.1 Aim:

The aim of this project is to give reliable and efficient services to passengers by developing bus booking and tracking system with the use of web based technology.

4.2 Objectives:

- To Change the Manual booking system into an automated web based system
- To develop the system with user-friendly interface and easy procedures to attract passengers.
- To help to achieve continuous and profitable growth in the transportation industry.
- To make it easy to access and use.
- To implement the solutions through system and making it more effective such as developing system to book bus ticket whenever or wherever passengers are.
- To finalize the project documentation.

5. Proposed Solution

Web Based Systems for Online Bus Booking. As proposed solution I am generating an online bus booking system for improvise current situation of bus transportation services. So first of all I have to mention that we are trying to save time and money through our system. Online booking is designing through a web system using PHP, HTML, CSS, Ajax and jQuery etc...We just need to pay attention

through solution according to below details.

| Input | Output | Process | Users |
|---|--|---|------------|
| Passengers details, Available Seat, Payment details | Confirmed message, Travel details, see the location of the bus in Map | Passengers info is stored in database, book available seat and stored Latitude and Longitude in database | Passengers |

Table 1 Nature of Solution

All the users can produce their details and reserve tickets with their seats. In this system there are alternative methods to pay such as Easy cash, PayPal. At the time you have been confirmed your ticket you will get a message with an identical number. The most effective thing is you can book any time of the day (24 hours) of the journey. The vital thing is you will get an alert when bus starts its journey therefore you can be ready for the bus. Here I am using PHP, and other web-based system to develop the system, Android system is used to send the exact location point of the bus with longitude and latitude map to the web services. We can check the locator through internet or android phone. Driver/conductor could check passenger's details through the system. They would take actions according to the situation through system. I can assure this system will make people feel comfortable with their journey. Nowadays most of the people are using internet to their daily uses. So through online booking they would make their journey easy. From younger to elder ones all of them can use online booking from their place. If suddenly there was a breakdown, the management system would send you an emergency alert. Management system would take quick action according to the situation. This online booking system has all the effective systems that every passenger needed. I believe this effective and efficient system will be a great solution.

The following list simply categorizes the features of the system:-

- ✓ Choosing the destination.
- ✓ Choosing the available bus.
- ✓ Choosing available seat.
- ✓ Paying payment.
- ✓ Receiving confirmed message.
- ✓ Receiving alert message when bus leaves.
- ✓ Checking location indicator.
- ✓ If there is a breakdown receiving alert messages.

These are the main features of the system. And I have all the resources to make this system a success.

6. Technologies & Resources

Well-designed websites will help us make a good impression on our potential clients. It also offers good user experience and allows our website users to access and navigate our website with ease. Technologies and resources are needed to create a well-designed website. The following are the technologies and resources the author will be using to design and build the web based online bus booking service system for HATHIF Passenger bus services.

6.1 Technologies Used

The following are some of the technologies to be used to design and build the online web application.

Visual Studio Code

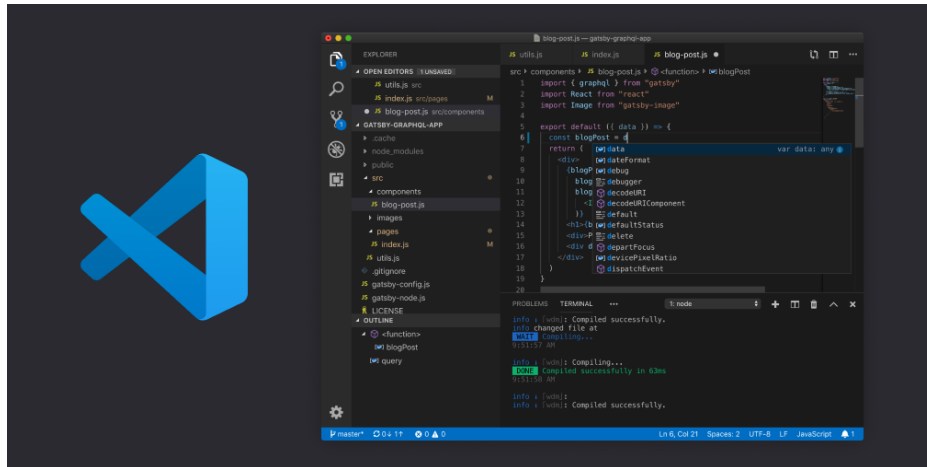


Figure 1 Visual Studio Code Editor

Visual Studio Code is a simple yet effective source code editor that runs on your desktop and is available for MacOS, Linux and Windows. Visual Studio Code IDE comes with built-in support for JavaScript, TypeScript and Node.js and has a rich ecosystem of plugins for other languages (like PHP, C#, C++, Java, Python, Go) and runtime (such as .NET and Unity). Hence, the SwiftWay website will be built using Visual Studio Code editor. (Visual Studio Code, 2022)

JavaScript



Figure 2 JavaScript

JavaScript is a cross-platform, object-oriented scripting language utilized to make websites interactive. Within the host environment (for instance, a web browser), JavaScript can be linked to the environment objects to offer programmatic control over them. JavaScript includes a standard object library like, Array, Date, and Math, and a core collection of language elements, like operators, control structures, and statements. The author intends to use JavaScript as well in order build the front-end and the back-end of the proposed project. (MDN, 2022)

Client-side Scripting/Coding

The following are the client-side technologies that the author intends on using for the proposed project.

HTML & CSS

HTML defines Hyper Text Markup Language. It is the most essential structure block of the Web. It describes the significance and structure of web content. The internet browsers know what to Demonstrate once they get the request thanks to HTML.



Figure 3 HTML and CSS

CSS defines Cascading Style Sheets. CSS is used to style web browsers. It depicts how HTML elements are to be shown on the screen. It enables one to adjust the presentation to

various kinds of devices, for example, huge screens, small screens, or printers. CSS is independent of HTML and can be utilized with any XML-based markup language. The separation of HTML from CSS makes it simpler to share style sheets over pages, maintain sites, and tailor pages to various environments. This is called the separation of structure from presentation.

At present, Cascading Style Sheets (CSS) and Hyper Text Markup Language (HTML) are running on latest versions, CSS3 and HTML5 respectively. HTML and CSS are one of the major technologies required to build the website. (James Martin, 2022)

Bootstrap

Bootstrap is the most broadly utilized of these frameworks. Bootstrap is an open-source Javascript framework created by the group at Twitter. Bootstrap is also called a Front-end-framework. It is a mix of HTML, Javascript, and CSS code developed to help design UI components. Bootstrap was likewise modified to support both HTML5 and CSS3.

Bootstrap is a free collection of tools for developing web applications and websites. It is complete with tools to normalize style sheets, add Javascript plugins, and design modal objects and a bundle of many other features.

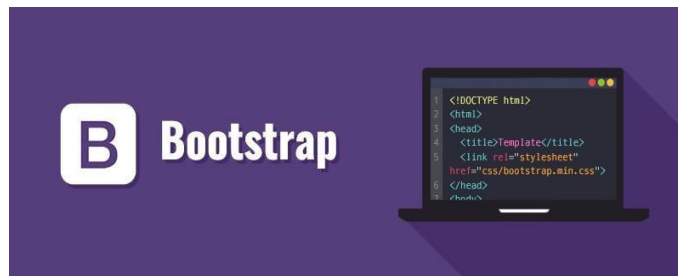


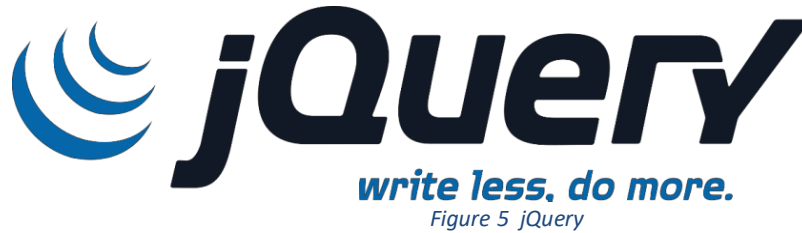
Figure 4 Bootstrap

It contains HTML and CSS-based design layouts for typography, buttons, forms, navigation and other interface parts, as well as optional JavaScript extensions. Hence, the author will be using Bootstrap to aid him in the development of the website. (codescratcher, 2021)

jQuery

jQuery is a little, light-weight and quick JavaScript library. JQuery is cross-platform and supports various kinds of browsers. Additionally, jQuery is alluded as "write less do more" since it takes a ton of normal assignments that requires many lines of JavaScript code to achieve, and ties them into strategies that can be called with a solitary line of code at whatever point required.

It is likewise exceptionally helpful to simplify on a ton of the complicated things from JavaScript, such as AJAX calls and DOM manipulation. Thus, the author will be using jQuery for making the web application better, faster, and more interactive.



Server-side Scripting/Coding

The following are the server-side technologies that the author intends on using for the proposed project.

XAMPP

XAMPP defines Cross-Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P). Due to the fact that XAMPP being simple, lightweight Apache distribution it is very simple for designers to make a local web server for testing and deployment purposes. All that you require is to set up a web server – server application (Apache), database (MariaDB), and scripting language (PHP). XAMPP works similarly well on Windows, Mac, and Linux.

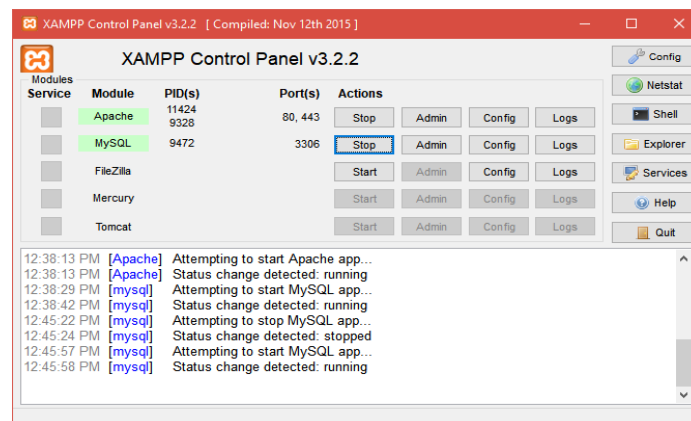


Figure 6 XAMPP

To run the PHP on any browser, one can put the PHP projects in the htdocs directory in the installation folder. To get to XAMPP from the browser, simply type localhost/xampp in the search bar after starting the server.

Briefly, XAMPP is an application which gives the Apache web server, MySQL database (really MariaDB), Php and Perl, all together. It is accessible for Linux, Windows, and MAC Operating systems. No configuration is required to integrate Php with MySQL. Hence, perfect for the author to develop the website.

PHP

PHP stands for Hypertext Pre-Processor. PHP is free and open source. It is a scripting language utilized for the development of static and dynamic web applications. Moreover, it is a server-side language, which implies that PHP is run on the server and the output is sent to the browser in plain HTML. Since php is an interpreted language, there's no need for a compiler. (Studytonight, 2021) The author plans to use php for the back-end development of the website.



Figure 7 PHP

MySQL



Figure 8 MySQL

Currently, MySQL is the arguably the most effective database management system program utilized to administer the relational database. MySQL is an open-source database program which is supported by Oracle Corporation. The database management system is fast, scalable and easy to utilize compared to Microsoft SQL Server and Oracle Database. It is typically used in combination with PHP scripts to create efficient and dynamic server-side or web-based business applications. Therefore, the author has chosen MySQL to be used in the server-side scripting/coding of the proposed project. (Javatpoint, 2019)

6.2 Resource Requirement

The following are the resource requirements;

Development Requirements

Software requirements

- Microsoft Visual Studio Code Editor
- Microsoft Windows 7 or greater operating system
- MySQL
- Xampp

Hardware requirements

- 8 GB RAM or higher
- 8 CPU cores
- 500GB capacity Hard Disk
- 2GB Video Graphics Adapter or Higher

Deployment Requirement

Server Requirement

- Windows/Linux
- 1TB of storage space
- 8GB RAM
- 8 CPU cores
- Web server - Apache

Client Requirement

- Operating System Windows/Android/IOS/Linux
- Internet Browser

7. Suggested Starting Point

As the starting point the first step of the project is to gather information through the clients, what they require in the Product selling and Management letter. Gathering user and system requirements is a very difficult task and the main purpose of collecting requirements process is gathering client's requirements in a project. Requirements Gathering is the process of generating a list of requirements such as functional, system, technical, etc. from the clients that will be used as the basis for the formal of requirement gathering. The methods which the developer has planned to use for information gathering are interviews and online surveys.

An **interview** is a commonly used data collection technique to collect user and system requirements. The interview is a valuable technique of gaining insight into people's perceptions, understandings and experiences of a given phenomenon and can contribute to in-depth data collection. However, the interview is more than a conversational interaction between two people and requires considerable knowledge and skill on behalf of the interviewer.

The **online survey** is one of the most widely utilized survey method which can be collect the information through an email where the respondents complete their questionnaire from google forms. Furthermore, the online survey provides highest level of satisfaction for the respondents because, they can answer the questionnaire according to their own way and chosen time. Online survey is very helpful and easy to collect the respondent's data as soon as possible.

Secondly, the Web Based Systems for Online Bus Booking system design should be sketched and wireframes should be designed through a designing tool to get the visual design of the Online Bus Booking. The designing part is very important when developing an online web-based system. Simply, the process starts with the sketches, continue with the wireframes and finish with the prototypes to get the visual design.

The tool which the developer planned to use for to sketch the Online Bus Booking system interface design is using a pencil and piece of A4 papers to draw the rough design of the system interfaces.

For the wireframes of the system the developer has planned to use Adobe XD which is one of the amazing UI UX development tools. It provides some unique options like not only designing interfaces, you can do the animations and the prototype to the interfaces in the same software. Designing interfaces in Adobe XD is very simple and it creates a good user experience right from the start. Furthermore, Adobe XD was the software is available with UI kits for macOS, IOS, Windows and Android.

8. Deliverables

The project deliverables chart the path to reach project objectives. The project deliverables are the key to a project's success. Hence, the following are the project deliverables with the milestones of the author's project

Milestone Chart

Project 'Milestone Chart' tool is a management tool that is used to describe the project schedule time table. Simply, a Milestone Chart focuses on planned significant events scheduled to occur at specific times in the program. It denotes the start date and finish date of the project activities and also mark the completion of a major phase of work. The milestone chart will be very useful when developing the Gantt chart, as the milestones divide the project timeline into different phases. Therefore, the milestone of this project focuses on the major progress activities in this project and help in scheduling the duration of the project (acqnotes.com, 2019).

| No: | Milestone Activities | Duration |
|-----|---|---|
| 01. | Confirmation of the Project title. | 4 th April to 6 th April. |
| 02. | Introduction to the Project Proposal. | 8 th April to 9 th April. |
| 03. | Examine aims and objectives of the Project. | 10 th April to 11 th April. |
| 04. | Project Problems. | 12 th April to 13 th April. |
| 05. | Literature Review. | 14 th April to 16 th April. |
| 06. | Getting Feedback from the Supervisor. | 16 th April to 17 th April. |
| 07. | Finalizing the Project Proposal. | 16 th April to 17 th April. |
| 08. | Final Project Report. | Pending. |
| 09. | System design. | Pending. |
| 10. | Implementation and Testing. | Pending. |
| 11. | Getting Feedback from the Supervisor. | Pending. |
| 12. | Finalizing the Project Proposal. | Pending. |

Table 2 Milestone Activities.

Gantt chart

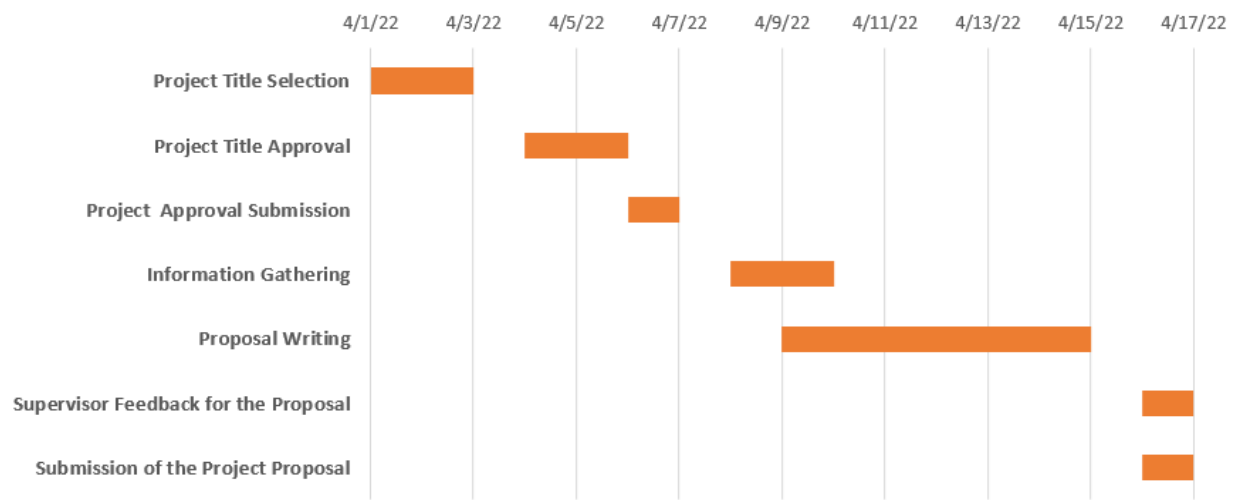


Figure 9 Gantt chart

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