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PlanTE: Bus Trip Planner Mobile Application

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PlanTE: Bus Trip Planner Application

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ABSTRACT

Bus transportation has played an essential role as popular public transport in Sarawak. However, the usage of public transport in Sarawak is less due to a lack of system management where society seems to need to be aware of bus schedules and bus routes, which makes the community prefer to use their car to go to their destination. This initiative can reduce traffic congestion and encourage people to use bus transportation as urban mobility. Therefore, PlanTE: Bus Trip Planner Application is developed as a mobile-based application for people to plan their trip in Kuching by using the bus as their urban mobility. This project aims to digitalize the information regarding the bus transportation schedule and route destination in Kuching, Sarawak. Hence, the documentation will cover the development of the PlanTE: Bus Trip Planner Application.

Keywords: plan, routes, schedule.

ABSTRAK

Pengangkutan bas telah memainkan peranan penting sebagai pengangkutan awam yang popular di Sarawak. Walau bagaimanapun, penggunaan pengangkutan awam di Sarawak kurang disebabkan oleh kekurangan pengurusan sistem di mana masyarakat nampaknya perlu mengetahui jadual bas dan laluan bas, yang menjadikan masyarakat lebih suka menggunakan kereta mereka untuk pergi ke destinasi mereka. Inisiatif ini dapat mengurangkan kesesakan lalu lintas dan menggalakkan orang ramai menggunakan pengangkutan bas sebagai mobiliti bandar. Oleh itu, PlanTE: Aplikasi Perancang Perjalanan Bas dibangunkan sebagai aplikasi mudah alih untuk orang ramai merancang perjalanan mereka di Kuching dengan menggunakan bas sebagai mobiliti bandar mereka. Projek ini bertujuan untuk mendigitalkan maklumat mengenai jadual pengangkutan bas dan destinasi laluan di Kuching, Sarawak. Oleh itu, dokumentasi ini akan meliputi pembangunan aplikasi PlanTE.

Kata kunci: *jadual, laluan, rancang*

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In Sarawak, particularly in Kuching, bus transportation has played a significant role as the most well-liked public service that is still in use today as one of the primary modes of transportation. Sarawak Transport Minister Datuk Lee Kim Shin announced an RM1 flat rate fare in 2020 as a Sarawak new initiative to revitalize ridership in city buses and major towns throughout the state, and the offer letter for the flat rate scheme was presented to four companies: Bau Transport Company Sdn Bhd, City Public Link Bus Sdn Bhd, Petra Jaya Transport (Sarawak) Sdn Bhd, and Biaramas Sdn Bhd. (The Borneo Post, 2020). After the Covid-19 Movement Control Order (MCO) is implemented in March 2020, this initiative aids bus companies in increasing the frequency of operations and improving their services. It also promotes the use of bus transportation as a mode of urban mobility that can enhance traffic flow by reducing traffic congestion.

One officially recognized bus company with a base in Kuching is City Public Link (CPL) Bus Sdn Bhd. It is a well-known express bus services provider with a variety of daily itineraries that travel to different locations throughout Kuching. The routes offered by City Public Link from Kuching began to be expanded in 2010 to include destinations like Serian, Jong Crocodile Farm, and Semenggoh Wildlife Sanctuary in Padawan. (City Public Link Bus Service, n.d.)

In this project, a mobile-based application is proposed and will be developed as an alternative for CPL's passengers to plan their trip in Kuching and helps the company to notify the passengers of the latest bus routes and schedules within the Kuching City,

Semenggoh Wildlife Sanctuary in Padawan, Jong Crocodile Farm, and Serian. This project intends to digitalize the current schedule and routes, which can help people to plan their daily trips and have easy access to view the bus schedules and bus routes.

1.2 Problem Statement

Nowadays, people did not use the bus for urban mobility in Sarawak, especially in Kuching, due to the lack of information regarding the bus schedules. This problem can lead people to miss the bus. Because the passenger does not know when the bus will depart from the main bus station, and this makes it hard for them to plan their trip. Apart from that, the information on the bus route is only displayed at the main bus station where people need to go to the bus main station to get the information regarding the schedule. The current manual system makes people prefer to use personal transportation due to the lack of two important pieces of information which are: schedule and route. Therefore, tedious problems in using the bus have led to the development of this project which is a mobile application that can help people to plan their daily trip by using the bus and easy access to view the bus schedules and bus routes.

1.3 Objectives

This project aims to digitalize information regarding the bus transportation schedule and plan trip route destinations in Kuching, Sarawak. Objectives that need to be achieved in this project are:

- To design and develop a mobile application that can be used to plan the trip based on user requirements.
- To test the application's usability and functionality based on the development of the prototype.

1.4 Scope

This project focuses on City Public Link (CPL) bus transportation company in Kuching-Serian, Sarawak. The proposed mobile application that comes with extended functionalities will provide the user with:

- View information on schedules and route
- Plan their daily trip:
 - Bus route
 - Bus Fare

1.5 Significance of Project

This project is significant for several points below:

- Help users plan a daily trip in terms of time and distance from one place to another.
- Easy access to information such as schedules and bus routes for users to view.

1.6 Expected Outcome

A useful mobile application, 'PlanTE' known as Bus Trip Planner Application, is what is anticipated as the project's end product. It is a contemporary and straightforward method of disseminating information about bus schedules and routes. The simple functionality is to help users easily view the bus schedule and plan their route from one point to another.

1.7 Project Outline

Chapter 1 and Chapter 2 are about the background of the investigation and analysis area which is known as the "Literature Review". Both chapters will solidify the context of problem establishment from published materials such as articles and journals. Project general introduction will be provided in Chapter 1, and a details description of the project will be provided in Chapter 2.

In Chapter 3, the discussion on the implementation of the methodology will be elaborated in detail based on the selected methodology that is used to develop the application. Rapid Application Development will be explained thoroughly in this chapter.

Chapter 4 is an elaboration on the implementation and testing phase of project development which includes the design of user interface and Application Programming Interface (API) Interface from the analysis results.

Chapter 5 is the depth of testing phase of project development which includes test case and feedback from the test results.

Chapter 6 is the conclusion of the future work for the project that will include the plan for the project.

1.8 Chapter Summary

In conclusion, the problems in the current manual system in providing information regarding the schedules and bus routes require a modern and simple solution to digitalize the information for public access. Therefore, the objectives and methodology of the project are thoroughly explained to ensure the project support and addresses the issues outlined in the problem statement. Hence, the scope has been clearly defined to maintain the project outlined. Apart from that, the project schedule is shown in the Gantt chart as a direction for the development of the project and guarantees the progress according to plan. Lastly, the expected outcome for this project will be a useful mobile application, 'PlanTE' known as Bus Trip Planner.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

The overview of three current applications and the upcoming application will be covered in this chapter. The review focuses primarily on these mobile applications' features, benefits, and drawbacks. After thoroughly examining all the features, a comparison will be conducted between the three currently available mobile applications and the suggested mobile application. There are several ways to plan a trip using public transportation, either walk-in to the central station, mobile application, or web system. The proposed mobile application's idea is to plan trips based on the management of schedules and routes. The proposed application's main features provide users with digital schedules and bus routes. As a result, it can help users plan their trips using public transport efficiently.

2.2 Background Study

In the twenty-first century, quick access to information has become crucial for everyone, especially travellers and commuters. A well-designed trip planner attracts more customers for the public transportation operator; informs passengers about possible: faster, safer, more comfortable, and less expensive modes of transportation; and protects the environment by reducing the use of private cars. Hence, it results in lower CO2 emissions; and reduces the use of paper maps and schedules in stations (Ștefănescu et al., 2014). The term "trip planner" typically refers to software programmes. It allows users to access Advanced Travel Information Systems (ATIS) using a user-friendly interface on computers or mobile devices connected to the internet (Nuzzolo et al., 2015). These programmes enable a path search engine to find the best travel options (paths) on transportation networks and to include all

pertinent information, such as travel time, cost, estimated departure and arrival times, service characteristics, alerts, and disruptions (Nuzzolo et al., 2015). It also represents those as mentioned above for all demands.

However, the proposed mobile application is focused on local bus trips in Sarawak, especially in Kuching, by using bus transportation as urban mobility. It acts as a planner for a passenger to plan their journey efficiently. Unlike travel planners, bus trip planners mainly focused on providing schedules and routes for each bus city in Kuching.

2.3 Comparative Study of Existing Application

This chapter will focus on three existing public transportation trip planner mobile applications. The three existing mobile applications are:

2.3.1 Moovit Application

Moovit App Global Ltd., or TranzMate, is an urban mobility application widely used globally, based in Israel. The founders of Moovit are Nir Erez, Roy Bick, and Yaron Evron (Ohnsman, 2017). Moovit was launched in 2012 as a free app, a journey planner. The application aggregates data from private and public transportation providers and hosts a repository of real-time public transportation data. The data are gathered from users using crowdsensing, a technique in which a large group shares data collectively (Santos & Nikolaev, 2021). The process is entirely dependent on the goodwill of (public transportation) users and their mobile devices' sensing and computing abilities. Users are not compensated or given discounts in exchange for providing data to the company. Moovit's users can establish their reputation through gamification tools like a point system. Users earn points for each contribution, eventually moving up levels to boost their reputation in the community, which increases their motivation to use the app (Santos & Nikolaev, 2021).

Moovit provides users with a real-time view of their surroundings, including the best route for their travels, by combining data from public transit operators and authorities with real-time user information (About Moovit: The Leading MaaS Solutions Provider, 2022.). It also provides features similar to the proposed application, which is planning the journey, such as choosing routes. Moovit provides features are viewing real-time arrival info, setting favourite lines, stations, or places, real-time service alerts, and viewing information on bike routes and docking stations.

Figure 2.1 shows the homepage for Moovit, where users can choose their destinations. Also, it will show users' favourite destinations. While in Figure 2.2 it shows nearby stops based on real-time navigation. Figure 2.3 provides information regarding public transportation routes for each stop. Moovit also allows user to set their search preferences, as shown in Figure 2.4. While Figure 2.5 shows the suggested routes for users to choose after choosing their destination. However, the Moovit application does not provide a transportation schedule, especially if the bus is involved. Apart from that, the Moovit application features only cover urban mobility in West Malaysia, especially in Selangor, Kuala Lumpur, and Penang.