Chapter 43

Public Bus Tracker Application (DirectMe)


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ABSTRACT

DirectMe is an application that helps users travel using available public buses. The idea is based on problems faced by users today who are facing with time crunch and frustration of not knowing when their public transports are supposed to arrive. Users usually don’t even know the exact location of a bus and end up missing them. It is difficult for the users to keep update of the bus location and the schedules are usually inaccurate. Furthermore, users don’t exactly know the exact bus fares to reach their destination and which bus to choose from. It is time consuming to get all the information needed in order to get to a destination using the public buses prepared by the government. Thus, the assist of this application exists. The use of this application can help users manage their time wisely and not get lost on their trips. With this application, users can know the exact location of the bus with the help from live updates using their phone’s GPS. They can track the routes and fares of each available bus on that particular area and decide on which bus to use to get to their destination. With this application, it will save users’ time and energy as everything will be informed and notified using DirectMe. This application is easy to access. Users’ can download it from Google Play store or Apple App Store without any payment require. The application can ease the flow of users’ daily commute or traveling without having to waste time waiting for the bus at the usually packed bus stop. Nevertheless, this application will not only benefit the local but also the tourist alike to get to their destination.

Key Words: bus, GPS, time, location, direction
1. INTRODUCTION

Public transportation is a means of commute that can be accessed by the public. It comes by different forms, such as, buses, trains and taxis to name a few. The earliest public bus service started in Paris in 1662 by Blaise Pascal. It started with seven horses – drawn coach which could fit six to eight passengers at a time (Randy Alfred, 2008). As time passes so does the invention of public buses, which now could fit to about 44 passengers per trip. However, operating a big service including a huge base of users, problems are bound to arise. Issues that commonly experienced by public bus users are not knowing the exact location of the bus and not knowing what time the bus would arrive at its designated stops. Because of this, the public masses would always run into problems such as, not getting to point B from point A on time and having to find other solution in order to get to their destination.

Thus, this project is being introduced in order to solve those issues. By introducing an application that could help ease users’ mobility when commuting using the public bus, we can help users detect the bus location and its exact commute time from a single platform. Prior to the innovation of this application, we tried to discover to what extend does these problems bothers the public masses by giving out questionnaires to random people. It is aimed to understand better and on what point should we focus on in order to create the most suitable application that could help public bus users.

2. LITERATURE REVIEW

The Global Positioning System (GPS), formerly known as NAVSTAR GPS, is a U.S. government-owned satellite radio navigation system run by the U.S. Air Force. It is a global satellite navigation system (GNSS) that provides a GPS receiver with geolocation and time information anywhere on or near the Earth where four or more GPS satellites have an unbroken line of sight (Global Positioning System Standard Positioning Service Performance Standard: 4th Edition, 2008). Obstacles such as hills and buildings have blurred the relatively weak GPS signals. The GPS does not allow any data to be transmitted by the user and operates independently of any telephone or internet reception, although these technologies can improve the utility of GPS positioning information. The GPS provides military, civil and commercial users around the world with vital positioning capabilities. The U.S. government has created, installed, and made the system freely available to anyone with a GPS receiver.

Vehicles are currently equipped with GPS technology, which helps us to solve this challenge by correctly interpreting and managing the data provided by GPS devices. In this study, we present a method based on GPS-generated data to systematically monitor and provide users with the exact location of buses, the schedule of the buses, the routes of the buses, the fares, and even an emergency feature that can directly connect with any party concerned. The framework can be applied to each bus companies as well.

The most significant negative experiences that drove a reduction in transit use were delays perceived to be the fault of the transit agency, long waits at transfer points,
and being prevented from boarding due to crowding. It is found that passengers are much more concerned than just when the bus arrives, a factor traditionally considered affecting performance expectations. Passengers are worried about the types of delays that they experience and when they happen during the journey. For instance, passengers are more likely to be angry at a transfer stop than at an origin stop, where they board the bus or train for the first time. The top reasons people give up on public transit, according to the researchers: delayed on board due to transit vehicles backed up or problems on the transit route downstream, experienced long wait at a transfer stop, missed departure due to wrong real-time information, unable to board or denied boarding due to crowding, delayed on board due to emergency or mechanical failure, experienced long wait at origin stop, ran to stop but the bus or train pulled away, and delayed on board due to traffic (McMahon, 2013).

Unless a company has enough money to invest in more frequent service, they are limited by their options to reduce such stressful waits. Thankfully, one of the newest tools available to them is proving to be extremely effective (Jaffe, 2014). GPS-based mobile applications that use it to tell riders where a bus is at any given moment is changing the waiting game in ways that experts are only starting to measure in hard numbers. Thus, the creating of GPS for buses will basically ease the journey of the riders as all information is placed in one app. This will help those who running behind schedule to save their time and energy and also improve the reliability of the buses’ services.

3. METHODOLOGY

This project intends to develop an application for users who commute using public bus without having to face a lot of difficulties. The application needs to have features such as live tracking by using GPS, bus fees for each trip, route for every bus, and accurate time tracker. Therefore, installing or providing GPS for every public bus is the first step to creating this application. To provide the GPS, a deal with every public bus companies is required, and then we can link the movement of the bus with our tracking application. Next, to develop and design the application which could work on IOS and Android Systems. In the design of the application, a search bar is needed for the user to key in the desired destination; thus, a map to track movements of all public buses will help the user to know which bus they need to take. Hence, list of buses will also appear which contain details, such as, timing of the bus from the users nearest bus stop, the bus fares and lastly the route of the bus. Other features of the application would also include notification and profile customization.

How the application function is, upon clicking the application icon, the user is required to switch on their phone’s GPS. This would automatically detect the user’s location and enables them to search their chosen destination. Once they have picked their destination, a list of buses which stops at that destination would appear. From those lists of buses, detail such as route, fees, time to destination, distance of user to final destination from their nearest bus stop, would all appear. Then, users may choose and click on their preferred bus. Finally, users are now able to keep track by looking at the
display of their chosen bus movement from the bus current location heading towards the users waiting point with expected time to reach.

4. RESULT AND DISCUSSION

A survey was conducted among 35 publics in early October 2019 randomly through online survey. The survey covers consumers opinion on public bus transportation services in Malaysia. There are two things that our project would like to understand which are ‘Consumer’s Critique on Public Bus Transportation’ and ‘Consumer’s Perception of Public Bus Transportation Features’.

![Figure 9: The Consumer’s Critique on Public Bus Transportation](image.png)

Figure 1 above shows the percentage of agrees and disagrees on The Consumer’s Critique on Public Bus Transportation. The analysis of the survey data identifies key points with several questions related to consumers’ opinion towards public bus transportation services. Based on figure 1, the highest critique for consumers is that they agreed that they have to wait for a long time at the bus stop for their bus (94%). Following closely, they agreed that it is difficult to obtain details about the bus (86%) and they have to deal with a lot of problem to ride one (80%). Moreover, they agreed that they have difficulties of not knowing which bus uses which route (71%) and they also faced the issue of not being able to stop the bus on time (66%).

Based on the data analysis, it is proven that there are a lot of consumers or respondents having a negative experienced using public bus service. Things became worse especially for those working in the city and public bus is their main public transport beside trains. This shows that this innovation is at urgency needs.
Figure 2: The Consumer’s Perception Of Public Bus Transportation Features

Figure 2 shows the percentage of yes or no answer about the Consumer’s Perception of Public Bus Transportation Features. The analysis of the survey data identifies key points with several questions related to consumer’s perception of public bus transportation features. Based on figure 2, all of the consumers answered ‘Yes’ on question would they like to know the routes of different buses around or nearest to them (100%). Furthermore, 97% of respondents would like to have an app that could detect the exact location of the bus and 94% would like to have an app that could show the exact time the bus would arrive. Lastly, 91% respondents would like to know the exact bus fares of different buses from a single platform.

Based on the analysis made from the figure, majority of respondents or consumers would like to have features that could help them ease their commute time and energy spend on doing research about what time, what route to take, how much is the bus fares and which bus to take. Eventhough, there are applications that can provide information to users, however they are either out-dated, inaccurate or needs constant maintenance. Our application is unique, it is based on constant real time tracker of buses and the user’s exact location.

5. CONCLUSION AND RECOMMENDATION

In conclusion, we can conclude that users strongly agree on the idea of developing an application to track public buses that provides features which could ease their daily commute. As we know, there are public bus tracking applications nowadays, however, the existing application are not based on the real time. Therefore, DirectMe will assist users with special features in their application, such as, the ability of users to key-in their preferred destination on the search bar and information regarding available buses for
said destination would appear. In accordance to that, nearest bus stop, accurate bus time as link by the bus's and user's GPS, bus fares and bus’s routes would appear along with the list of available buses for searched destination. Thus with the aid of the application, users would not need to worry of the possibility of taking the wrong bus or getting lost on their trips.

From the results of this report, it is clear that most of the users facing problems regarding public bus transportation. To help increase the accessibility and mobility of users, a few recommendations are proposed to improve our public transportation system in Malaysia. One of the things APAD (Land Public Transport Agency) should do is to create a standard operating procedure and rules for bus drivers to adhere to, so that they can act professionally, and passengers will be treated well from departure to arrival. This includes things like communication between the driver and commuters, the way the bus departs and arrives and breaks times for drivers.

Next, open data should be embraced by operators, too, by having ridership statistics not just for trains, but also for bus routes and stations to go public. Live GPS data from public transit should also be made available for third-party apps like Google Maps for commuter convenience.

Lastly, we believe improving bus infrastructure should be the focus as the bus experience is poor and low quality. City councils should plan and construct safe and disabled-friendly walkways between nearby existing bus stops and train stations, along with good signage. Bus shelters should also be constructed or renovated to protect commuters against rain and heat at all times.

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