Bussin: A Bus Tracker Apps using Mobile Application Development Lifecycle Model

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Abstract: Problem arise on students who takes bus for their daily occasion. The issues appear to be increasing in college. One of the problems found is, new students or first-timers are anxious about boarding a bus without knowing its timetable or destination. Second, students have difficulty tracking arriving buses because they do not always arrive on time. To assist students in overcoming these issues, the idea is to create an app called Bussin to assist students in making their golden time much more valuable. Functions added to the app that allows users to find out which bus they need to catch by searching the designated place. It will provide them a list of buses to choose from and the route they should take. Furthermore, the applications will display all buses travelling through their campus, as well as the projected time for the buses to arrive at the bus stop, they are at. As all the students will be using this apps, we track them soon as they enter the bus that will let users know whether the buses are on their full capacity or not. Hence, from the issues stated, methodology uses for the products are divided of three aspects which is identifying, designing and prototyping phase. The key to the product is to identify the problems faced by certain party and come up with the idea for the solution by designing how the system would be. At last, the prototyping of the product is made to have a clear objective of how the product will be for the final touch.

Keywords: Public transportation, Bus tracking, Mobile application,

1. Introduction

The introduction of information and communication technologies bring a new drive for students in universities to have more access and facilities that will ease their movements in college [1,2]. Many mobile applications have been developed since the era of technologies dominating the world [3,4,5]. Platform such as Waze, Moovit, Grab helps the user to move from one location to another yet there is still something lacking in the university for students to be able to go to classes as the buses that patrol around the college seems to be inefficient in schedules.

After conveying a survey at UiTM on how the buses works. The majority of UiTM students are unclear of the exact time each bus will arrive. Furthermore, the bus schedules are arbitrary indicated on the bus stop, which is every 30 minutes, and they have mentioned three (3) buses for each session, but only one or two are travelling. This may cause problems with student time management, and any plans made may have to be postponed in order to accommodate undetermined transportation schedules. Furthermore, the buses may be overloaded, allowing just a few passengers to board, leaving the remaining passengers to wait even longer, uncertain whether the next bus would be empty or not. Another concern in bus management is the manner in which buses are abandoned at bus stops. This could lead to misunderstanding among students who rush to the bus stop only to be disappointed by the lack of services available. Students spend time and energy getting from one bus stop to the next.

Our application has come out with many goals that we want to achieve. For example, we need to provide the best service for users of this application and strive to meet users' needs. We also strive to meet users' expectations about our applications. Below are some of the objectives for us to achieve for this application to improve user waiting time management and other relative information about the bus's service. Another reason is to help users to know the schedule of the bus that is available according to the time and place that has been provided. Last but not least to help users to know the capacity of the bus before they ride.

2. Materials and Methods

The decision to create this application came from our own experience and some other student with using the campus busses which can be a bit irritating sometimes because of their inefficiency. It has been shown in the survey that we did to collect the data about the student's opinion regarding the current system that the university use for its busses. The current system they use is by uploading the bus schedule on the campus telegram platform, printing the schedule, and putting it at the bus stops all around the campus. But, even with that the busses still did not come on time, and it makes things difficult for the students.

Figure 1 shows the Bussin development process using the Mobile Application Development Lifecycle Model (MADLC)
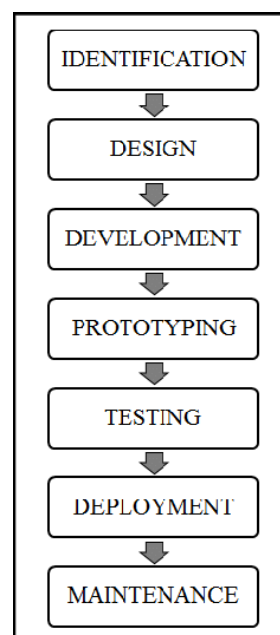

Figure 1 : Bussin development process

2.1 Identification Phase

The identification phase, which deals with both functional and non-functional components of the application, is the first and most important step of the development life cycle of mobile applications. Ideas are gathered and sorted in this stage. The main goal is to develop a fresh concept or enhance an already successful application. The consumer, often known as the client, or the developers may come up with the concepts. The inspiration for Bussin arose from a study of UiTM students who reported difficulty finding buses in their neighbourhood. For each bus navigation test, we reviewed the current mobile application. The programmes mostly serve the single function of identifying the best path to take when allocating destinations. The prior applications were different in that they didn't display the bus's location or the routes it was travelling. As a result, these features will be included in our completely new technology, Bussin a bus tracker apps. During this phase, determining the amount of time needed to develop Bussin is another crucial responsibility. The design team should then receive a copy of the documentation detailing the work done by the mobile application idea team.

2.2 Design Phase

We made the decision to start from scratch when designing the systems' user interface. Low-fidelity designs were created in the form of sketches. An early design for the application is being created using the information we learned from the survey. The team has also determined the information required, conducted research on a case study of a bus monitoring system, and identified the steps involved in each navigation tracking test, such as the addition of GPS as a feature.

2.3 Prototyping Phase

The functional requirements of each prototype will be inspected, tested and sent to service users for review during the prototype phase. In addition, UiTM academics and students were given a Bussin Application for their feedback. Each review has been documented and is required for modification during the development stage. Until the final Bussin Application prototype is ready, the prototype design is repeated. Academics and students were given one last chance to provide feedback on the final prototype. Prototype phase work was documented after obtaining final feedback for the Bussin prototype.

3. Results and Discussion

Table 1 shows the outcomes of survey that has been done. We have asked a few students about this matter, and they all share the same dissatisfaction regarding the bus system that is currently being used on the campus. All of them agree that the current system that they use does not facilitate them and causes problems for them because of the lateness of the bus arrival. Even if the bus did come on time, sometimes it might be overloaded and resulting in them not being able to ride it.

Table 2 shows the developed Bussin application. The system has a wide range of special features that will help students handle all of their difficulties and ensure that they are delighted with the applications' services. The product is designed to last in the universities, making it one of the best inventions in history that will contribute to a student's everyday effectiveness. Following the above goals, this program's mission is to be the most effective and methodical application for tracking buses, resulting in a happy and satisfied user at all times.
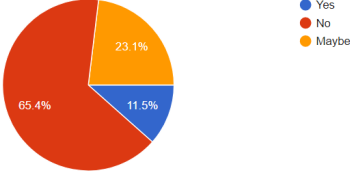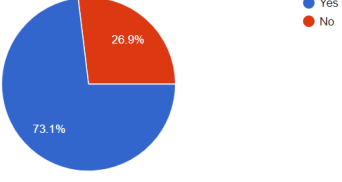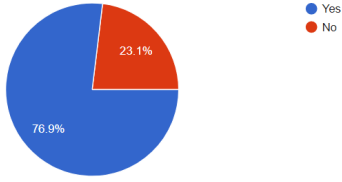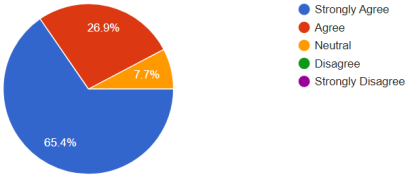
Table 1: The outcomes of survey
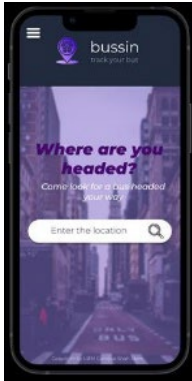
| Survey results	Findings
Do you think the bus schedules and route is efficient? 26 responses Yes — 11.5% No — 65.4% Maybe — 23.1%	Based on the following pie chart, 65.4% students agree that bus systems schedules and route are inefficient.
Do you ever feel anxious of taking bus wondering if you'd take the right bus to your destination? 26 responses Yes — 73.1% No — 26.9%	Majority agrees that they felt anxious whether they are on the right bus or not.
Have you ever waited for a bus only to discover it was packed with passengers, preventing you from boarding? 26 responses Yes — 76.9% No — 23.1%	76.9% studeny agrees that they did experience waiting for a bus that only just packed to hop on in.
What do you think about bus tracker apps that allow you to follow the whereabouts and routes of the bus? 26 responses Strongly Agree — 65.4% Agree — 26.9% Neutral — 7.7% Disagree Strongly Disagree	65.4% of students strongly agrees of the development of bus tracker apps, 26.9% students agrees while the 7.7% is being neutral.

Table 2: Bussin application

Page Interface	Page Description
	This is the welcome and users starting interface after they click the start button at the home page. So, at the starting page there are two buttons which are 'login' button and 'sign up' button. For the users who are using this application for the first time, they need to sign up first. Otherwise, they can click the login button to go to the next interface.
	This is the login and signup interface. Users need to input the details to log into the Bussin application.
	This is the home interface. Users will see this page after they log into this application. There is a search box for the users to enter the location that they are headed.
	This is the navigation bar for this application. In this navigation bar, there are six section which are home, user profile, favourite, history, help & support, and settings.

This is user profile interface. In this section, it will show the users background details such as full name, campus, phone number and email address. Users can also edit all the information.
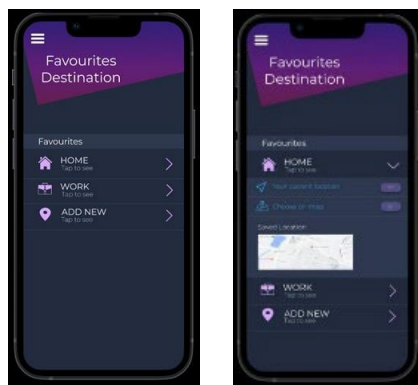

This is the saved location interface. In this section, there are three favourites destination for the users put in which are home location, work location and users can add new location that they want to save.
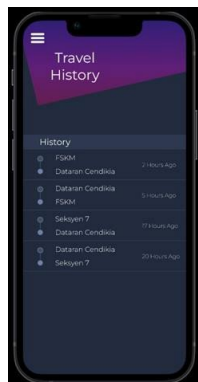

This is the travel history interface. In this page, users can view all the location that they have been go by using this application.

This is the help & support interface whereby user can ask for help and support if they could not understand or have difficulty by using this application. Users just need to insert the subject and the description.
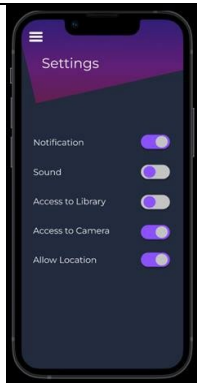
This is the settings interface. Users can control the notifications, sound, access to library, access to camera and also allow location either they want too on or off it.
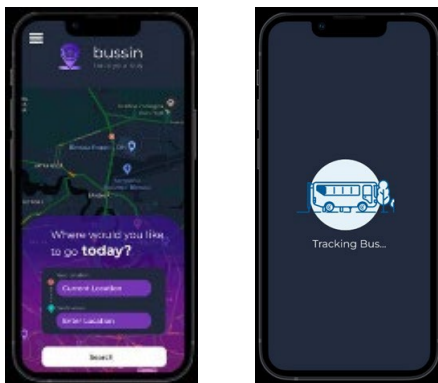
This is the search destination interface whereby user need to enter their location and destination where they want to go so that the application can make a searching if any bus available. Loading page will appear when the page is in a loading process to go to the next page.

This is the list of buses interface. In this page, it will show the users all the bus available for the location that has been enter by the user. So, the users can choose which bus that they want to ride.
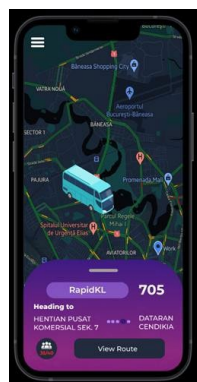
This is the bus chosen interface where it will show the bus trip that has been selected by the user. From there, users will know the estimated time to wait for the bus at the stop. User will also be notified on the capacity of the buses at the bottom left of the interface

4. Conclusion

As a conclusion, many colleges are still using the traditional way of using paper and files to keep record of the bus route and schedule as well as provides information through notices which is not effective and there is need of a systematic way of keeping records as well as providing information as per the need. Also, students even do not know about the proper timing of the bus. Some students wait for the bus being unaware of that the bus had already been missed and they are late for the class. Due to unforeseen events like traffic jams and bus breakdowns, it is highly challenging for the bus management side to give users of the bus an accurate schedule.

In order to enhance bus system and increase the performance of bus service provider, the smart bus tracking application is necessary which provides real time information of bus to remote user. So, we proposed a new application which overcome the drawback of university transportation system called Bussin Application. Bussin Application has delivered the objective of this project which are student can plan their time more effectively without having worry about missing the bus. Instead of wasting time waiting for the bus, they were able to track its location and use that time for other preparations. Moreover, the chosen methodology for the development if thus mobile application is The Mobile Application Development Lifecycle whereby the user can install the application in Playstore for android and AppleStore for iOS at anytime and anywhere.

Acknowledgement

References

[1]   Patil, B., Patil, R., & Pittet, A. (2011). Energy saving techniques for GPS based tracking applications. ICNS 2011 - Integrated Communications, Navigation and Surveillance Conference: Renovating the Global Air Transportation System, Proceedings, 1–10. https://doi.org/10.1109/ICNSURV.2011.5935335

[2]   Sneha, M., Urs, C. N., Chatterji, S., Srivatsa, M. S., Pareekshith, K. J., & Kashyap, H. A. (2014). Darideepa: A mobile application for bus notification system. Proceedings of 2014 International Conference on Contemporary Computing and Informatics, IC3I 2014, 724–727. https://doi.org/10.1109/IC3I.2014.7019815

[3]   Rohani, M. M., Wijeyesekera, D. C., & Karim, A. T. A. (2013). Bus operation, quality service and the role of bus provider and driver. Procedia Engineering, 53, 167–178. https://doi.org/10.1016/j.proeng.2013.02.022 65

[4]   Sarah Aimi Saad, Amirah 'Aisha Badrul Hisham, Mohamad Hafis Izran Ishak, Mohd Husaini Mohd Fauzi, Muhammad Ariff Baharudin1, Nurul Hawani Idris (2018). Real-time on-Campus Public Transportation Monitoring System. 2018 IEEE 14th International Colloquium on Signal Processing & its Applications (CSPA 2018) ISBN: 978-1-5386-0389-5

[5]   Nurul N Jamal. (2018). Real-time Campus University Bus Tracking Mobile Application. Real-Time Campus University Bus Tracking Mobile Application. Retrieved July 2022, from https://www.researchgate.net/profile/Nurul-Jamal-5/publication/328834009_Real-Time_Campus_University_Bus_Tracking_Mobile_Application/links/5d9ae3de458515c1d39c4b00/Re al-Time-Campus-University-Bus-Tracking-Mobile-Application.pdf