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STUDENT RIDE

HAILING

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STUDENT RIDE HAILING

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STUDENT DECLARATION

I certify that this report and the project to which it applies are the results of my own work and that any concept or quote from the work of other persons, whether written or otherwise, is completely acknowledged in accordance with the standard reference practices of the discipline.



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ABSTRACT

This project aims to solve the problem of students struggling to find ride-hailing services from other students. Current solutions, like creating social media groups or posting announcements in random group chats, often fail because they get lost in too much information. This project proposes a new platform where students can easily find ride-hailing services offered by other students with just a few taps on their mobile devices. This platform will make it more convenient and ensure important information isn't missed.

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CHAPTER ONE: INTRODUCTION

1.1 Project Background

Globally, ride hailing services have gained widespread popularity as a convenient and efficient mode of transportation. The ride hailing system in Malaysia has been shaped with various factors, such as the rise of digital technology, evolving transportation needs and changing consumer preferences. With smartphone and its GPS technology, ride hailing platforms can connect passenger with drivers through their smartphones. Compared with traditional taxi services, it has provided greater convenience, transparency, and affordability to users.

In Malaysia, ride hailing has become a source of income among the Malaysians. It has attracted many drivers due to its flexible and independent form of work.

1.2 Problem Statement

In University Teknologi MARA (UiTM) located in Shah Alam, Selangor, the university policy stated that student who got to stay in campus as residents are not allowed to bring their own vehicle as they have to walk or use the public transport provided by the university. This ruling, UiTM believed that it could reduce traffic congestion on campus. However public transport, such as bus services, can make passengers feel dissatisfied caused by the delays and waiting time. Safety could be an issue for public transport passengers too(Hashi, Mohamad, Haron, Hassan).

Therefore, UiTM Shah Alam students are having difficulties in having the transport services to go to their desire places , especially going to their classes.

- i. Student hard to find the transportation services made by other student in social medias.
- ii. There is not much mobile application that can provide motorcycles as the transportation vehicle

1.3 Objectives

This project aims to develop a ride hailing mobile application called Student's Ride, that will provide a platform for UiTM Shah Alam's students to get their transportation services from another students.

Objective 1: To design a mobile application that lets the drivers to be able to use motorcycle or car as a transportation service for students.

Objective 2: To develop a system where students can find their drivers through a map with an easy-to understand user interface.

Objective 3: To evaluate the project's result to its functionality.

1.4 Project Scope

This project only focusses on:

- Community of students in UiTM Shah Alam.
- Design a ride hailing system with suggestion places around Shah Alam.
- Using android user interface.
- Firebase Database.

After a proper planning, the scope of this project is as shown below:

- Target user
 - o UiTM Shah Alam's Students.
- Testing environment
 - o UiTM Shah Alam's surroundings.
- Ride-hailing system
 - o Focusing on providing the students with transportation services.

1.5 Project Significance

Students do not have to worry about the high amount of money they need to pay for using the transportation services. They also can easily get a driver that is available around them since the mobile system is focusing on a small area. This can help students to be at the desired destination easier and faster. Safety can be performed well due to only among students that use the mobile application. Motorcycle as a transportation service can be available for drivers to business.

By having this platform, it can help the entire UiTM Shah Alam students to have a good transportation services environment.

1.6 Summary

Student Ride Mobile Application is targeted for UiTM Shah Alam Students who have problems in using the other current ride hailing mobile application. The problem statement is students are having a difficult time in getting transport services. The objective of the project is to develop a platform for the students to get the transportation service given by other students.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction to Ride-hailing

In this chapter, briefly explain about ride hailing and learn about it through journals, articles and other relevant materials for the project development.

2.1.1 Definition of Ride Hailing.

App-based ride-hailing is an emerging travel option that will allow travelers to use their smartphone and open the application (such as Uber, Lyft, and Didi Chuxing) to request a ride in real-time from drivers who registered in their application. When using ride-hailing services, usually, waiting time is shorter and more reliable than taxi services. Other than that, travelers who use ride-hailing do not need to find parking. With these advantages of using ride-hailing, recent years have recorded that ride-hailing services have increased substantially. There are several impacts when using ride-hailing, some of them are travel behavior, trip frequency, travel mode choices and vehicle miles traveled. (Kunbo, Rui, Jonas, Long, Frank, 2021). Ride-hailing has become an alternative travel method in many cities worldwide. Regarding its interaction with public transport, proponents have claimed that ride-hailing is now one of the important facilitators of a car independent lifestyle.

2.1.2 Ride Hailing vs Public Transport.

Ride-hailing has certain advantages over public transport. Some researchers find that public transport is most likely substituted by ride-hailing. However, some studies found that the most substituted mode is traditional taxi or private car. These findings create difficulties in inconsistent results. The interaction between these two services (Ride Hailing and Public Transport) and the extent to which ride-hailing competes with or complements public transport is still largely unknown. It has more benefits than public transport. The attributes of the ride-hailing option. Studied have been made about the comparison between public transport and uber.

2.1.3 Effects of Travel using Ride-hailing

Ride-hailing compared to traditional public transport, ride-hailing services often found more flexible, reliable, and convenient. Travel behavior has been influenced by ride-hailing in recent years, as the body of research has done its explored. Nonetheless, because of the inconsistency of previous research, the topic remains poorly understood.

Towards the 21st century, ride-hailing services began to enter the market through smartphone applications. The applications will allow consumers to hail and pay for their ride from drivers who own a vehicle. The transportation market has had effect on overall transportation system, including congestion, total vehicle miles traveled and greenhouse gas emissions. From a small body of research, that is conducted in 2016 and 2017, they have provided several evidence on the impacts of these services. The research includes population representative survey data, measure ride-hailing driver and passenger activity data and targeted ride-hailing user survey data (Caroline Rodier, University of California, Davis, 2018)

Some of the effects are:

- Auto ownership: From the research that has been done, 10 percent of the respondents stated that they have given up a vehicle after joining ride sharing.
- Trip generation: Research indicates that physical and legal limits on driving have been reduced.
- Mode choice: This study has shown that carpool, walk and bike travel has reduced and carsharing may also reduce caused by ride-hailing.
- Network vehicle travel without passengers.

2.2 Type of Ride-hailing

2.2.1 Ridesharing

Ridesharing is an innovative on-demand transport service that aims to provide transport, car utilize reduction, increase vehicle occupancy and public transport ridership. Ridesharing has been described as various mobility sharing concepts. Ridesharing refers to the use of motor vehicles by drivers and passengers, to compensate the driver or to share the cost using billing information provided by the participants. Ride-sharing trips are usually pre-arranged through matching applications. These applications allow drivers and passengers to find potential rides. The mobile application benefits to environment when travelling with others. (Lambros Mitropoulos, Annie Kortsari, Georgia, 2021).

2.2.2 Motorcycle Ride Hailing

In last few years, two-wheeled motorcycle-based ride-hailing services have become popular in developing and emerging economies (Sub-Saharan Africa & South-East Asia). Motorcycle not available in most places because motorcycles were never used before to provide commercial mobility services. The number of motorcycles is useful metric not for understanding potential travel and congestion impacts only, but it is also important from safety perspective. This is because, motorcyclists are more vulnerable compared to other motorized transport users. For trips consisting of only one passenger, motorcycles are convenient and can be cheaper than using traditional taxis or other form of transportation services. Motorcycle ride-hailing is popular due to their ability to weave through the stagnant traffic and in small alleys. This has made them significantly quicker than other road-based vehicles. Motorcycle ride-hailing has traditionally flourished by offering flexible, accessible, and door-to-door service in the absence of organized, reliable transport services. In Bangkok, motorcycle ride-hailing has served 4 to 6 million trips every day in 2013. However, motorcycle rides are prone more accidents compared to other road vehicles due to being the most vulnerable to injury and fatality in case of accidents.

2.2.3 Taxi-Hailing

Taxi-hailing is basically taxi drivers joined e-hailing platforms. Taxi-hailing can be more convenient due to matching algorithms. For example, passengers can make car requests anywhere they are, and drivers can match with nearby riders easily. When passengers have arrived at their destination, they can pay the fare via an electronic payment such as credit card instead of cash. However, the accountability mechanism has been improved so that passengers can directly pay within the app. Drivers perceived as providing poor service will receive low scores. This means that the future requests will impact to their career. “Didi” is the largest internet taxi company. Since the launch of the platform, the technology of Didi has improved. (Yiting Gan, Hongchao Fan, Wei jiao, Mengqi Sun, 2021).

2.3 Mobile Application

2.3.1 Smartphone Operating System (Android/iOS)

There are many operating systems for smartphones. The main mobile operating systems used by modern smartphones includes:

- Android
- iOS
- Nokia's Symbian
- Blackberry OS
- Microsoft's Windows Phone

Android and iOS provide not only operating system but provide mobile development platforms because they both are facing tough competition with each other.

Android Inc was founded by Andy Rubin in 20225. Google acquired it and then the team lead Rubin developed mobile device platform powered by Linux kernel. Applications are usually developed in Java language using Android Software Development Kit, but other development tools are also available to use, such as Native Development Kit or extensions in C or C++. Besides providing an open development platform, Android has offers developers the ability to build a rich and innovative applications. Developers can take advantage of the device hardware access location information, run background services, set alarm, add notification etc. Android OS is used on smartphones, netbooks and tablets including TV and other devices. The features of Android, are as following:-

- Notification window: Drop down notification from apps across the phone.
- Widgets: User does not need to open app due to home screen functions.
- Gmail integration: Gmail is heavily present in Android.
- Multiple account functionality: More than one Google account can be used.
- Third party app development kit and support: Individual or other companies can make apps for Android Operating System.
- CDMA support: Android can be used on Verizon and other CDMA providers.

iOS is Apple's mobile operating system. Developed for the iPhone originally. iOS now can also support other Apple's devices such as iPad, iTouch, and Apple TV. iOS has technologies that are available only on itself, such as multi-touch interface and accelerometer support. iOS also has numerous applications, according to reference, iOS has more than 300,000 applications in Apple's App Store. This can be credited to iOS software development kit. This kit contains the code, information and tools people need to develop, test, debug, run, and tune application for iOS. Some of the features of iOS are:-

- Apple Safari web browser: Apple web browser for mobiles.
- Support for 3rd party apps: Users and companies can develop apps.
- iOS Developer Kit: Code used to develop apps for 3rd party support.
- Microsoft exchange support: push email and other features have support.
- iCloud: A network for user that allow them to setup and connect all their Apple devices.
- iMessage: Apple's texting app.
- Etc.

2.3.2 Mobile Application Development.

Native App Development is where developers create applications by using a platform whether Android or iOS. It can support all features of OS and allows to utilize the maximum potential of mobile devices.

Web App Development is simply a website that provides an actual responsive website. Mostly it is written using HTML, CSS, and JavaScript, and it will run in a browser. Installing such apps is just means , it creates a bookmark to this page, calling the link of the app.

Hybrid App Development is half native and half web applications. It can take advantage of some of the native features. Due to it is web applications too, it can depend on HTML that can get presented in a browser. It can help developers to reach larger target audience without bothering developing two different applications. (Aijaz Ahmad Sheikh, Tehseen, Nisar, Khursheed)

2.4 Databases

A database is a collection of information or data that have been organized and stored in an electronically computer system. Usually, a database is controlled by a database management system, for short term DBMS. Data commonly modeled in rows and columns in a series of tables. This is to make processing and data querying efficient. Those data will be able to be accessed, managed, modified, controlled, updated, and organized. In this session, types of database explained.

2.4.1 MySQL

MySQL database is the most widely used, open source, relational database management system. Its database management system has been developed by Sweden in 1995 and owned by Oracle Corporation. MySQL workbench capable of capturing cardinality constraints of type One-to-one and One-to-many. MySQL workbench refers to ERDs as Enhanced Entity Relationship diagram. It can recreate the models using its reverse software engineering procedures. MySQL Workbench can satisfy many demanding database designers because it can provide excellent graphical and technological tools. (Jerzy Letkowski)

2.4.2 MongoDB

MongoDB is an open source NOSQL database that falls under the classification of document database. It was written in C++, and it was initiated by 10gen company. MongoDB documents are stored in binary form of JSON called BSON format. BSON can support string, date, integer, Boolean, float, and binary types. MongoDB has less schema, so it gives the freedom for user to insert new fields or update the previous structure of document. MongoDB supports Master Slave replication where slave nodes contain the replicas of master nodes. These are used for backups and reads. (Divya, Kartik)

There are several advantages of using MongoDB compared to MySQL. MongoDB can integrate an online platform which will allow users to publish different articles, books, magazines and so on. It gives them the possibility to share their items online with other people. The result from the study made, MongoDB seems to have a much higher working speed compared to the speed of MySQL. MongoDB also has a good performance; it was

faster than MySQL in all insert cases. Besides higher speed between MongoDB and MySQL, in all the operations that were performed, MongoDB has provided a very important benefit, namely, customizing the application. It is because MongoDB allowed modeling the application to the needs of users, thanks to the fact that MongoDB does not have a predefined data structure, unlike MySQL. (Cornelia, Robert, Ioana, Bandici)

2.4.3 Firebase Database

Firebase is made by Google that literally designed to use as a Google-backed application development software. Firebase is a software developed in 2011. This database allows developers to develop IOS, Android and Web applications. Firebase also provides features that can benefit developers a lot for example, tools for tracking analytics, fixing app crashes, and do reports. Some of the services that Firebase can offer are analytics, authentication, cloud messaging etc. The data stored in JSON and can be queried by users. This database can provide permissions by setup rules. This way, the database can be secure. For example, this can be done by simply using the help of Firebase Authentication by giving certain user-identities to have the permission to access the data.

What are the pros of using Firebase as a database? Firebase can give developers easy access to data via Firebase console. The data updates and offline access can make the database useful for real-time application. Other than that, Firebase also requires no payment to use the services. This can help developers to understand whether it fits the application that been developed by the developers.

Eventhough, Firebase as database can be very useful for making applications, there still some drawbacks that need to be think of. Firebase query function is limited. If developers need more advanced query functions, Elastic Search server can be considered to send datas or collect for more search options. Furthermore, Firebase is only available for Android studio, meaning it only help the development for android applications.

2.5 Mapping technologies

Technology mapping, also called as technology “Roadmapping” , used to describe the methods in generating technology roadmaps to support decision-making processes and organization strategic planning. Technology mapping or Roadmapping is one of the tools that communicate and visualize required messages to company management regarding current patterns of technology. Technology mapping is a concept that combines communication and innovation in the technology management field. The objective of technology mapping is to support the development and implementation of integrated strategic products, business, and technology plans. (Abuseem, Yumna, Alzaabi, Abeer, Fikri, Ubaid, 2020)

2.5.1 Global Positioning System

Global Positioning System (GPS) is a system where it is based on using satellites to navigate and it is made up of a network of 24 satellites placed into orbit. Many applications have use GPS nowadays that demand information of the position, speed, or acceleration. GPS is often embedded in computers, smartphones, or separated GPS modules for vehicles. The vehicle uses the GPS to control as well as to obtain the position of moving vehicle, especially for the company of transportation fleet. GPS is also used to obtain all the information supporting the corporate development to serve its customers. GPS tracking provides the information of the latest position which was updated continuously in real-time by using:- (Mulia, King, Budiawan, Tanutama, Rinda, 2015)

- High Speed Downlink Packet Access (HSDPA)
- Enhance Data for GSM Evolution (EDGE)

2.5.2 Geographic Information System

Geographical Information System (GIS) is tool that can help in decision making to analyze and interpret relationships, patterns, and trends. Its utility is considered at all levels and there is a growing awareness of its economic, social, and strategic values. It is used to select suitable locations for any purpose ranging from renewable energy sources and livestock.

2.6 Searching and matching technologies

Searching is a process that cannot be issued for a communication and transaction process. Basically, searching is a process that usually performed each day activities. Search process usually done to look for something with the purpose of knowing the data. For example, passengers will use ride-hailing systems to search for their rider to go to their wanted destination.

Through matching technologies, ride-hailing applications right now can reduce the number of wait-sensitive passengers to cancel their ride. Different matching technologies produce different passenger wait times; this is because they send drivers on different paths when picking up passengers. For example, Drivers had to travel through the city to pick up passengers according to the matching technology employed by their ride-hailing service. There are two matching technologies used in ride-hailing services; street hailing and central dispatch.

- Street hailing model is a made when passengers standing on the road hails an available passing driver.
- Central dispatch model is on-demand platform acts that receives ride requests from passengers and assigns them to drivers based on their locations.

2.6.1 Geolocation and GPS

Geolocation system has evolved to include a sophisticated Global Navigation Satellite System (GNSS) receiver, several real-time streaming position correction sources, and additional position sensors. Geolocation system designed to provide location data.

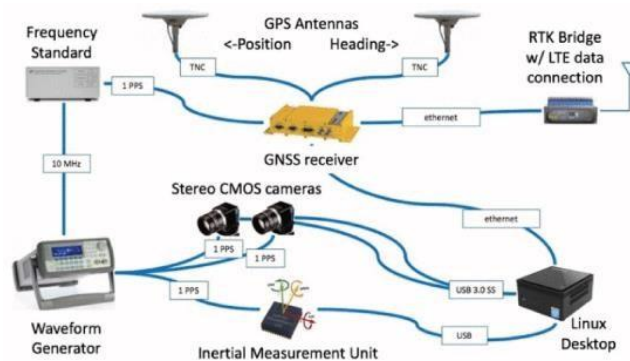


Figure 1 : System-level diagram of geolocation system

2.6.2 Real-Time Matching Algorithms

Real-time map matching has been required in several applications, such as transit control, and fleet management. GPS technology and other road sensors are employed. This is to provide real-time road congestion and off-street parking availability information through Variable Message Signs(VMS). This will influence the driver's decision in choosing which route to take or where to park. These systems interact with vehicle's navigation systems and users to provide updated real-time parking information such as capacity, location, parking fee, availability, and performance of specific on-street or off-street parking system.

2.7 Related Works

2.7.1 A case study of Grab business

Grab transportation services is a business that makes people's life more convenient for finding ride experience in the digital era. It continuously gains popularity of using the service. Grab is the market leader in on-demand ride-hailing transport services for both categories; two-wheeled vehicles and four-wheeled vehicles. The features that could be found in this application through this journal are provide green car concept, rent-a-car feature, sharing real-time location between drivers and passengers, food delivery, reward redemption and booking service. (Sasiwimol Wiengdee, 2019)

[Green Car is basically an option provided by Grab for passengers who aware of pollution and environmental impact. Green cars are usually using electric cars. Grab is using a good strategy in promoting green car by making electric car option cheaper.]

2.7.2 Dacsee Company: Expanding into Carpooling in Malaysia

Dacsee is a new player in the ride-hailing industry, the application has been launched in 2018. Dacsee's name comes from "Decentralized Alternative Cabs Serving and Empowering Everyone". Purpose of the ride-hailing application is that provide driver and customers who have mobile phone GPS powered application where both can see other on real-time and customer allow to make drive booking. One of the feature of Dacsee application is similar to Grab, where people can share taxi rides with another person. This ride-hailing application also provides rewards for loyal customers who use both ridehailing services and carpooling services. Allowing passengers to add new drivers to their favorite list, so that they can use the same drivers' service at other times. Dacsee allows passengers to book car with female driver, this step allow female passenger feel more comfortable while using ride-hailing. Anyone cannot be Dacsee's drivers but with condition, where the individuals have skills and previous record. (Jarkko, Daisu, Olli, Saana, Iiro, Nikita, 2019)

2.7.3 Key Success Factors of Organizational Success: A Study of MULA Car International

MULA Car, is Malaysian-driven company that aimed to provide a wide range of passenger transportation network and logistics services through its state of mobile application. MULA's headquarters is in Penang. It promotes safe and comfortable ride sharing services with a brand-new fleet of premium, luxury MPVs and compact cars for the customers. MULA also allowing drivers with their vehicles to join. MULA offers several services such as instant booking, prebook and chartered services for local tours on all their cars at very affordable prices. This ride-hailing service's priority is passengers' safety and comfort. It also provide parcels service in the application. (Ashraff, Daisy, Roshini, Hazimah, Aina, 2020)

2.7.4 EZCab: A Cab Booking Application Using Short-Range Wireless Communication

EzCab is an ubiquitous computing application that allows people to book nearby cabs using their smartphones or PDAs equipped with short-range wireless network interface. EzCab booking system rely on centralized schemes for cab dispatching such as making phone calls to taxi company or sending short messages(SMS) to certain server over cellular links. Due to no need to gather the location of all the cabs in real-time, EzCab dispatching system is simple, fast and scalable since it works in complete decentralized fashion. EzCab is made by two technology trends; firstly, the transformation of PDAs and smartphones into relatively powerful mobile computers equipped with short-range wireless capabilities. Secondly, increasing presence of powerful embedded system, GPS receivers and wireless network interfaces in modern vehicles. Some of the features are, using Smart Messages(SM) to perform routing and store routing information and booking cabs. (PengZhou, tamer, Porlin, Cristian, Liviu)

Project Title/Research Work Author & Year published	Purpose	Features	Platform	Description
A case study of Grab business (Sasiwimol Wiengdee, 2019)	Business that makes people' life more convenient for finding ride experience in the digital era. It continuously gains popularity of using the service. Grab is the market leader in on-demand ride-hailing transport services for both categories; twowheeled vehicles and four-wheeled vehicles.	<ul style="list-style-type: none"> • Provide epayment. • Provide green car concept. • Rent-A-Car feature • Sharing Real-Time Location • Food Delivery. • Reward Redemption • Booking Service. 	Mobile Application	<p>May implement payment methods used in this ridehailing application into the project.</p> <p>Food delivery, may also included into the project since students do sometimes order food from restaurants.</p>

Dacsee Company: Expanding into Carpooling in Malaysia (Jarkko, Daisu, Olli, Saana, Iiro, Nikita, 2019)	Provide driver and customers who have mobile phone GPS powered application where both can see other on real-time and customer allow to make drive booking.	<ul style="list-style-type: none"> • Carpooling services • Provide rewards for loyal customers. • Favorite list of driver. • Female driver option • Anyone cannot be Dacseedriver. • GPS 	Mobile Application	Carpooling helps reduce the cost that need to pay by students, may add into the project as an option for students to use the ride-hailing services.
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Key Success Factors of Organizational Success: A Study of MULA Car International (Ashraff, Daisy, Roshini, Hazimah, Aina, 2020)	Malaysian technologydriven company that aimed to provide a wide range of passenger transportation network and logistics services through its state of mobile application.	<ul style="list-style-type: none"> • Provide instant booking. • Luxury car option. • Pre-booking feature. • Parcels services. 	Mobile Application	Parcels delivery does not in the project, but possibly to add the feature into the project.
EZCab: A Cab Booking Application Using ShortRange Wireless Communication (PengZhou, tamer, Porlin, Cristian, Liviu)	Discovers and books free cabs by using mobile ad hoc networks of vehicles. Passengers and Driver can communicate using only shortrange wireless	Implemented Smart Messages, a middleware architecture based on execution migration, which to provide a common execution environment for outdoor ubiquitous computing applications.	Mobile Application	

	network interface.			
Student Ride Mobile Application	The purpose is to solve the problem of student by providing ridehailing services for students to go to their destination by directly contact to drivers without the need to search on social media or other application.	<ul style="list-style-type: none"> • In-Chat Application • GPS • Booking and prebooking. • Providing vehicle options such as motorcycle and car. • Place recommendation 	Mobile Application	

Table 1 : Summary of Related Works

CHAPTER THREE: METHODOLOGY

3.1 Introduction

In this chapter, we will be discussing project methodology that we will be using in this project. We have decided to choose the Agile Method, due to the benefits that can be gained from the method compared other methods for Ride Hailing Mobile Applications. Besides discussing the method that was used for the project, it will also discuss how the research is going to be conducted, the flow and the progress of the project.

3.2 Project Methodology Framework

Agile means swift or multipurpose. In this method, the software develops in incremental, swift cycles. The Agile process is popular due to its unique features that are able to be flexible and adjustable. The agile method gives leverage to make any change at any point in the project to meet the project's demands.

The table below will show the comparison between agile and traditional software development methodologies.

	Agile Method	Traditional Method
Approach	Adaptive	Predictive
Documentation	Low	Heavy
Domain	Unpredictable/ Exploratory	Predictable
Project Size	Small	Large
Perspective to Change	Change Adaptability	Change Sustainability
Emphasis	People-Oriented	Process-Oriented
Management Style	Decentralized	Autocratic

Table 2: Agile Method vs Traditional Method

The agile method proved to be very useful in challenging situations as the Agile development team can work in the cycle to find an innovative and productive solution, which can meet the new demands of customers (Munteanu & Dragos, 2021).



Figure 2: Phases in Agile Methodology

3.2 Methodology Overview

PHASE	ACTIVITIES	DELIVERABLES
Requirements	Collect important requirements according to the project. This phase is to make sure that the requirements are testable.	<ul style="list-style-type: none"> • Information Gathering • Hardware Requirement • Software Requirement
Design	Design phase is to identify the project's components and architectures as well as illustrate the system's user interface.	<ul style="list-style-type: none"> • Use Case Diagram • Flowchart Diagram • Entity Relationship Diagram • User Interface
Development	Develop the system with code using the selected software and hardware.	<ul style="list-style-type: none"> • Develop and implement components.

Testing	Test the project to identify if there are any errors or issues that are need to be fixed.	<ul style="list-style-type: none"> Test the project to its fullest functionality and performance.
Deployment	During this phase, the product need to be ensured that the project is deployed and configured to maximize user experience.	<ul style="list-style-type: none"> Deploy the project for user to use and make changes if needed.

Table 3: Overview of Agile Methodology

3.3 Requirements

In this phase, all the requirements for both hardware and software will be listed. The hardware and software requirements are used for the project design, development, testing etc. This help in adjusting the functionalities of the project at early stage.

3.3.1 Hardware Requirements

This is the hardware used for the project.

Hardware	Description
Device Brand	LENOVO
Device Model	ThinkPad T470
Microprocessor Model	Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz, 2496 Mhz, 2 Core(s), 4 Logical Processor(s)
Memory	RAM 32GB
Hard Drive	ADATA SX6000LNP
Power	Lenovo AC/DC Adapter Charger

Table 4: Hardware requirement used in the project.

3.3.2 Software Requirements

This is the software used for the project.

Num.	Item	Description
1	Operating System	Microsoft Windows 10 Pro
2	Design Tool	Figma
3	Documentation	Word
4	Presentation	PowerPoint
5	Development Platform	Android
6	Database Platform	MongoDB

Table 5: Software requirement used in the project.

3.4 Program Design

3.4.1 Entity Relationship Diagram (ERD)

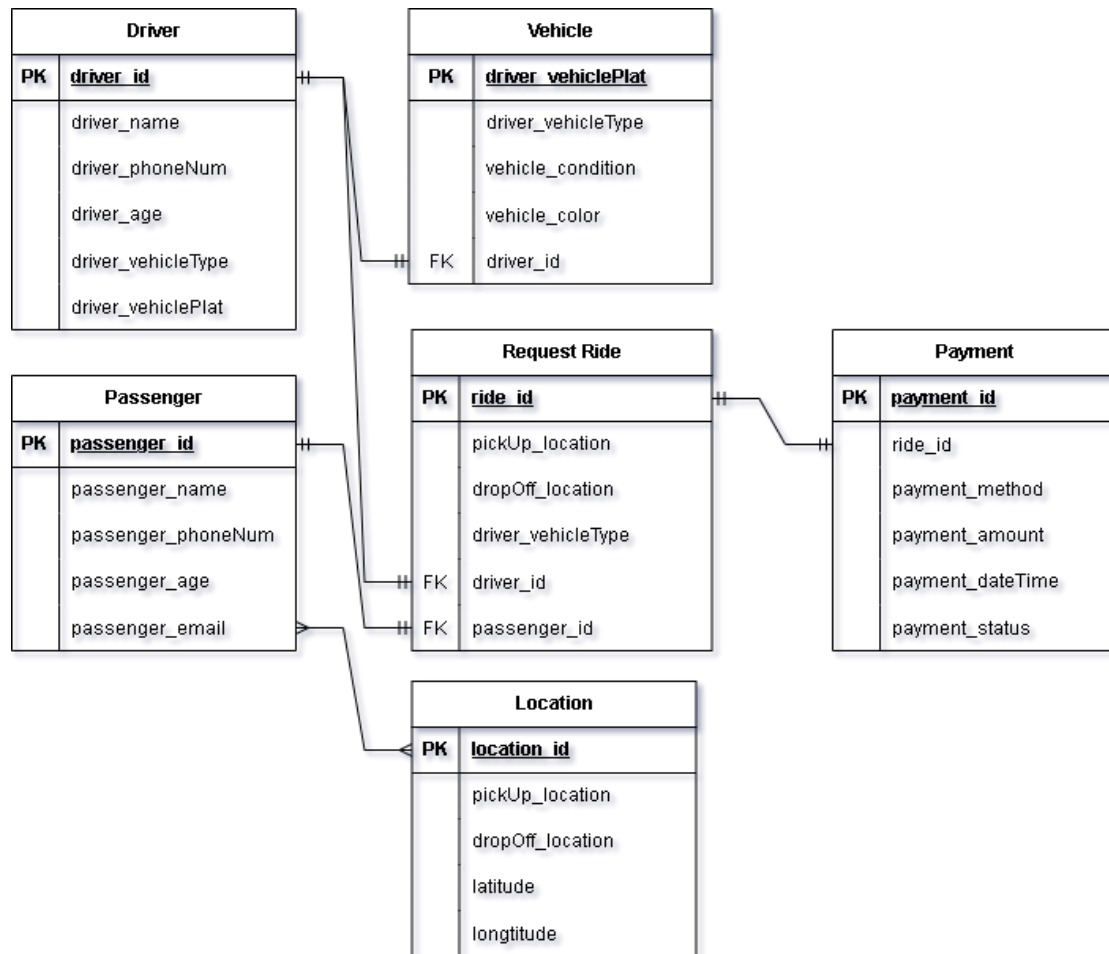


Figure 3: Entity Relationship Diagram (ERD)

Entity Relationship Diagram Description

- Driver – Vehicle : 1 Driver can has 1 vehicle, while 1 vehicle can be own by 1 Driver.
- Passenger – Ride : 1 Passenger can has 1 Ride, while 1 Ride can be request by 1 Passenger.
- Passenger – Location : Many Passengers can have many Locations, while many locations can be located by many Passengers.
- Ride – Payment : 1 Location can be paid 1 Payment Many Payment can be use in many Locations.

Data Dictionary of Entity Relationship Diagram (ERD)

Attributes	Entity: Driver	
	Type	Explanation
driver_id	String	Driver ID is the unique key of Driver.
driver_name	String	Driver's full name.
driver_phoneNum	String	Driver's phone number used.
driver_age	Integer	Driver's current age.
driver_vehicleType	String	Driver's vehicle used for the ride service.
driver_vehiclePlat	String	Driver's plat number of the vehicle.

Attributes	Entity: Passenger	
	Type	Explanation
passenger_id	String	Passenger ID is the unique key of Passenger
passenger_name	String	Passenger's full name.
passenger_phoneNum	String	Passenger's phone number used.
passenger_age	Integer	Passenger's current age.
passenger_email	String	Passenger's email address for confirmation.
Attributes	Entity: Vehicle	
	Type	Explanation
driver_vehiclePlat	String	Driver's plat number of the vehicle.
driver_vehicleType	String	Driver's vehicle used for the ride service.
vehicle_condition	String	Driver's vehicle current condition.

vehicle_color	String	Color of the Driver's vehicle.
driver_id	String	Driver ID is the unique key of Driver.

Attributes	Entity: Request Ride	
	Type	Explanation
ride_id	String	Ride ID is the unique key of Request Ride.
pickUp_location	String	Pick Up Location preferred by the Passenger.
dropOff_location	String	Drop Off Location chosen by the Passenger.
driver_vehicleType	String	Driver's vehicle used for the ride service.
driver_id	String	The foreign key of Request Ride.
passenger_id	String	The foreign key of Request Ride.
Attributes	Entity: Location	
	Type	Explanation
location_id	String	The primary key of Location.
pickUp_location	String	Pick Up Location preferred by the Passenger.
dropOff_location	String	Drop Off Location chosen by the Passenger.
latitude	Float	Representing the coordinate of Passenger.
longitude	Float	Representing the coordinate of Passenger.

Attributes	Entity: Payment	
	Type	Explanation
payment_id	String	The primary key of Payment.
ride_id	String	Ride ID is the unique key of Request Ride.
payment_method	String	The method payment done by the Passenger (Online / Cash)
payment_amount	Double	The amount of the payment paid.
payment_dateTime	Float	To show the date/time of the payment..
payment_status	String	To show the status of the payment.

3.4.2 Use Case Diagram

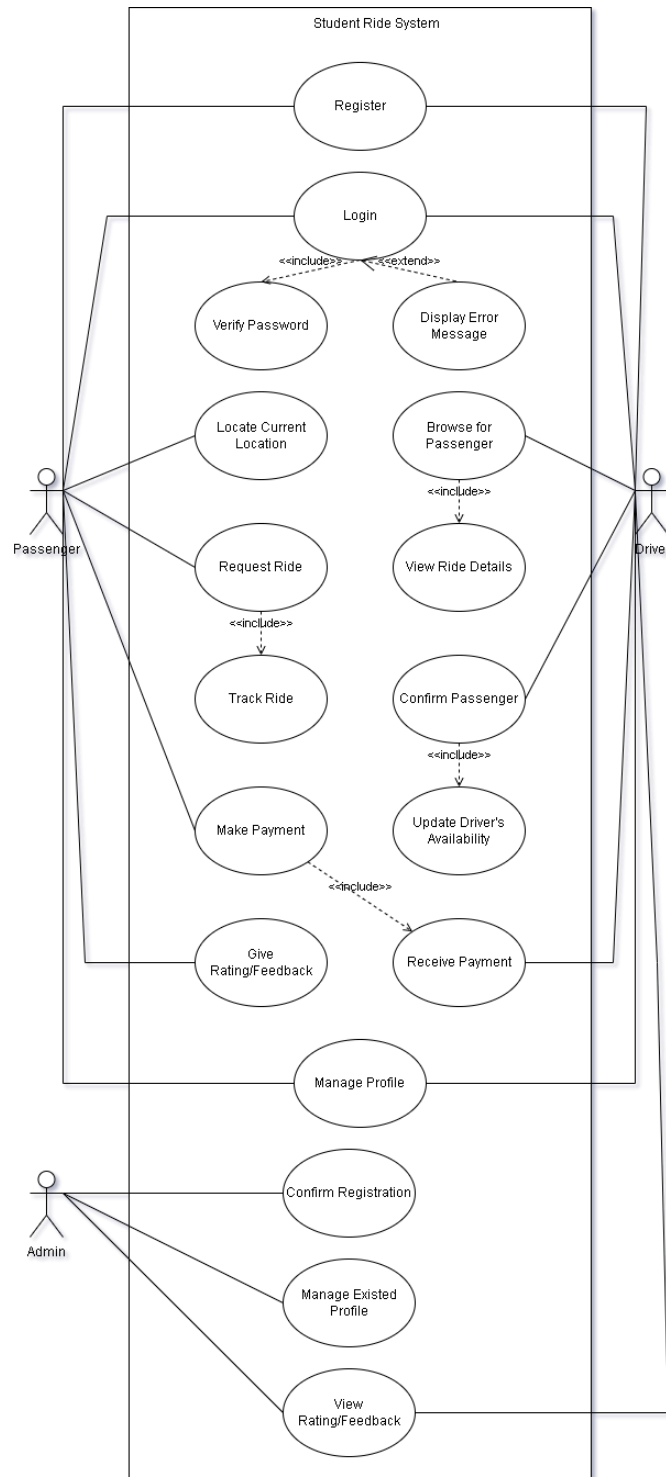


Figure 4 : Use Case Diagram

Use Case Description

There are several modules to be used in this ride-hailing mobile application. The module consists of register, login, request ride, make payment and so on.

Actor: Passenger & Driver

Use Case	
Title	Register
Actor	Passenger & Driver
Description	<p>This use case begins when Passenger or Driver wants to register account into the mobile application.</p> <p>Basic Path:</p> <ol style="list-style-type: none">1. Passenger or Driver needs to provide the details needed in order to register their account.2. Once finished, fill up the details, Passenger or Driver need add their student ID.3. Passenger or Driver can confirm their registration, and can gain access after successfully register their account. <p>Alternative Flow:</p> <p>Error message will be displayed if Passenger or Driver not able to fill up all the detail needed to register their account.</p>

Use Case	
Title	Log In
Actor	Passenger & Driver
Description	<p>This use case will allow Passenger or Driver to login into their account and can gain features provided inside the mobile application.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. After successfully registered Passenger & Driver account, they can go to this page to login. 2. Passenger or Driver has to enter username and password. 3. After successfully login, Passenger or Driver can access using their own account. <p>Alternative Path:</p> <p>If Passenger or Driver unable to enter their username or password correctly, error message will be displayed.</p>

Use Case	
Title	Manage Profile
Actor	Passenger & Driver
Description	<p>This use case begins after Passenger or Driver able to successfully login into their account.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Passenger & Driver go to the manage profile page. 2. Passenger & Driver can manage their profile such as username, password, Etc. 3. Passenger & Driver will be asked to confirmed the changes made.

Use Case	
Title	Locate Current Location
Actor	Passenger
Description	<p>This use case begins after Passenger able to login successfully.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Passenger will be able to locate their current location once login, 2. Current location will be provided as the home page to ease Passenger locate their current location quickly.

Use Case	
Title	Request Ride
Actor	Passenger
Description	<p>This use case begins when Passenger wants to request their ride.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Passenger can request rides after login successfully. 2. Passenger must fill up where to be pick up by Driver. 3. Passenger must fill up where to be drop by Driver. 4. Passenger needs to choose car as the vehicle. 5. Confirm needed to be done by the Passenger. 6. Passenger given option to do their payment method, Online Payment/Cash. 7. Passenger has to wait for confirmation from Driver.

	<p>8. Once confirmed by Driver, Passenger will be given Driver's details.</p> <p>Alternative Path:</p> <p>In Step 4, Passenger can choose other vehicle which is, motorcycle.</p> <p>In Step 8, if Driver has not confirmed, Passenger can cancel and make other request.</p>
--	---

Use Case	
Title	Track Ride
Actor	Passenger
Description	<p>This use case begins when Passenger locate their current location and after they successfully request a ride from Driver.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Passenger succeed request a ride from Driver. <p>Passenger able to track ride location using GPS technology.</p>

Use Case	
Title	Make Payment
Actor	Passenger
Description	<p>This use case begins when Passenger needs to do payment.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. After finished the ride with Driver, Passenger given option to pay using online payment or cash. 2. If Passenger choose cash, Passenger has successfully finished the make payment. <p>Alternative Path:</p> <p>In Step 2, if Passenger choose the option Online Payment, Passenger can make online payment. Once its able to be paid, system will display, “Success!”.</p>

Use Case	
Title	Give Rating/Feedback
Actor	Passenger
Description	<p>This use case begins when Passenger has finished their ride. Passenger has the option to give or not give their rating/feedback.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. After successfully paying the Driver, Passenger give the option to rate/give feedback to the Driver. 2. Stars will be displayed for Passenger to rate the Driver performance. 3. Passenger will be greet with “Thank you” message if Passenger has rated the Driver.

Use Case	
Title	Browse for Passenger , View Ride Details
Actor	Driver
Description	<p>Use case is to browse for Passenger that request a ride and they can view the details.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Driver can browse for Passenger that are request for ride. 2. A list of Passenger that are request for ride will be displayed. 3. Driver can view any of the Passenger, to see the details such as pickup Location, profile picture, Etc. 4. Driver confirm with the Passenger. 5. Driver can choose drop off Passenger. 6. System will be displaying, “congratulation” message. 7. Driver given option to keep up by pressing the button “List of Passenger” to see more Passenger that are request for ride. <p>Alternative Path:</p> <p>In Step 4, Driver has the option not confirm the Passenger, and keep up on browsing other Passenger.</p> <p>In Step 5, Driver also has the button to cancel the ride, if Driver unable to pickup Passenger or change their mind.</p>

Use Case	
Title	Confirm Passenger
Actor	Driver
Description	<p>This use case begins when Driver is open to pre-booking for Passenger to request a ride in the future.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Driver will be greet with a list of Passenger that are requesting for pre-booking ride. 2. Driver can view the ride details. 3. Driver confirm the ride. 4. The Passenger that has been confirmed by the Driver, will be listed in the Book4Later list. <p>Alternative Path: In Step 3, the Driver has the option to cancel the ride.</p>

Use Case	
Title	Receive Payment
Actor	Driver
Description	<p>This use case begins when Driver has finished their ride with Passenger.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Driver can receive payment once done with the ride of the Passenger. 2. If Passenger make payment through cash, Driver will get the payment physically. <p>Alternative Path:</p>

	In Step 2, if Passenger make payment through online, Driver will get the payment through the mobile application.
--	--

Use Case	
Title	Confirm Driver Registration
Actor	Admin
Description	<p>This use case begins when Admin need to confirm the registration of Driver.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Admin will be displayed with list of account that registered as Driver. 2. Admin can check whether the registration was made by students. 3. If the registration is made by students, Admin can confirm the account as a Driver in the mobile application. <p>Alternative Path:</p> <p>In Step 3, if Admin noticed, the registration not made by students, Admin can decline the registration.</p>

Use Case	
Title	View Rating/Feedback
Actor	Admin & Driver
Description	<p>This use case is to view the rating and feedback made by the Passenger.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Login as Driver or Admin. 2. Admin or Driver can view the rating and feedback in the record history.

Use Case	
Title	Manage Existed Profile
Actor	Admin
Description	<p>This use case begins when Admin wants to manage any existed profile. It is to control the behavior of the mobile application user.</p> <p>Basic Path:</p> <ol style="list-style-type: none"> 1. Admin selects the manage existed profile. 2. Admin can view the ratings or feedback. 3. Admin can ban the profile if there are any odd behavior made by the Passenger or Driver.
	<ol style="list-style-type: none"> 4. Confirm button and re-enter password will be needed as to manage the selected profile.

3.4.3 Concept Flowchart

Flowchart 1: Passenger Register

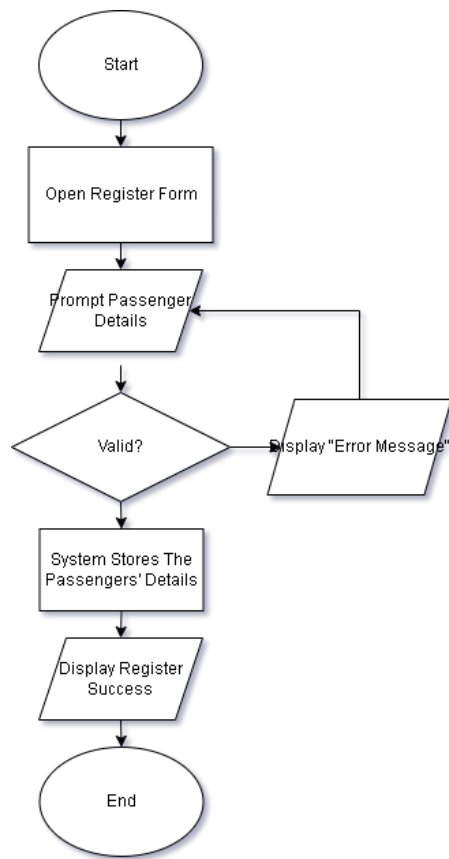


Figure 5: Flow chart 1

This flowchart is showing how a Passenger will do his/her registration before be able to login and has access to the mobile application. The system will check if the details prompt is valid. If the details are valid, the system will store the details in the server. If the details are not valid, the system will display “Error Message”.

Flowchart 2: Passenger Rating/Feedback

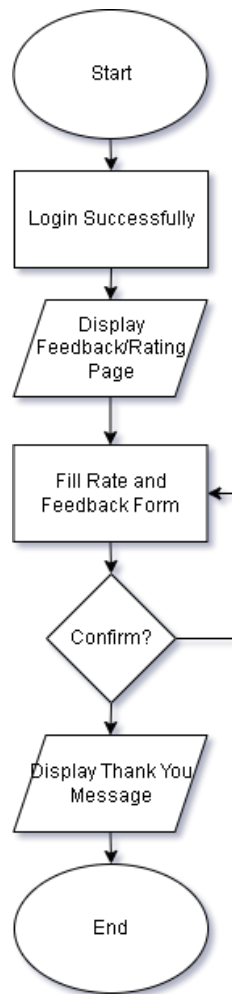


Figure 6: Flow chart 2

This is a flowchart of a Passenger leaving rating or feedback, by simply filling up the form that has been provided in the mobile application. Once he/she finished filling up the form, the system will display message, such as “Thank you”.

Flowchart 3: Passenger Request Ride

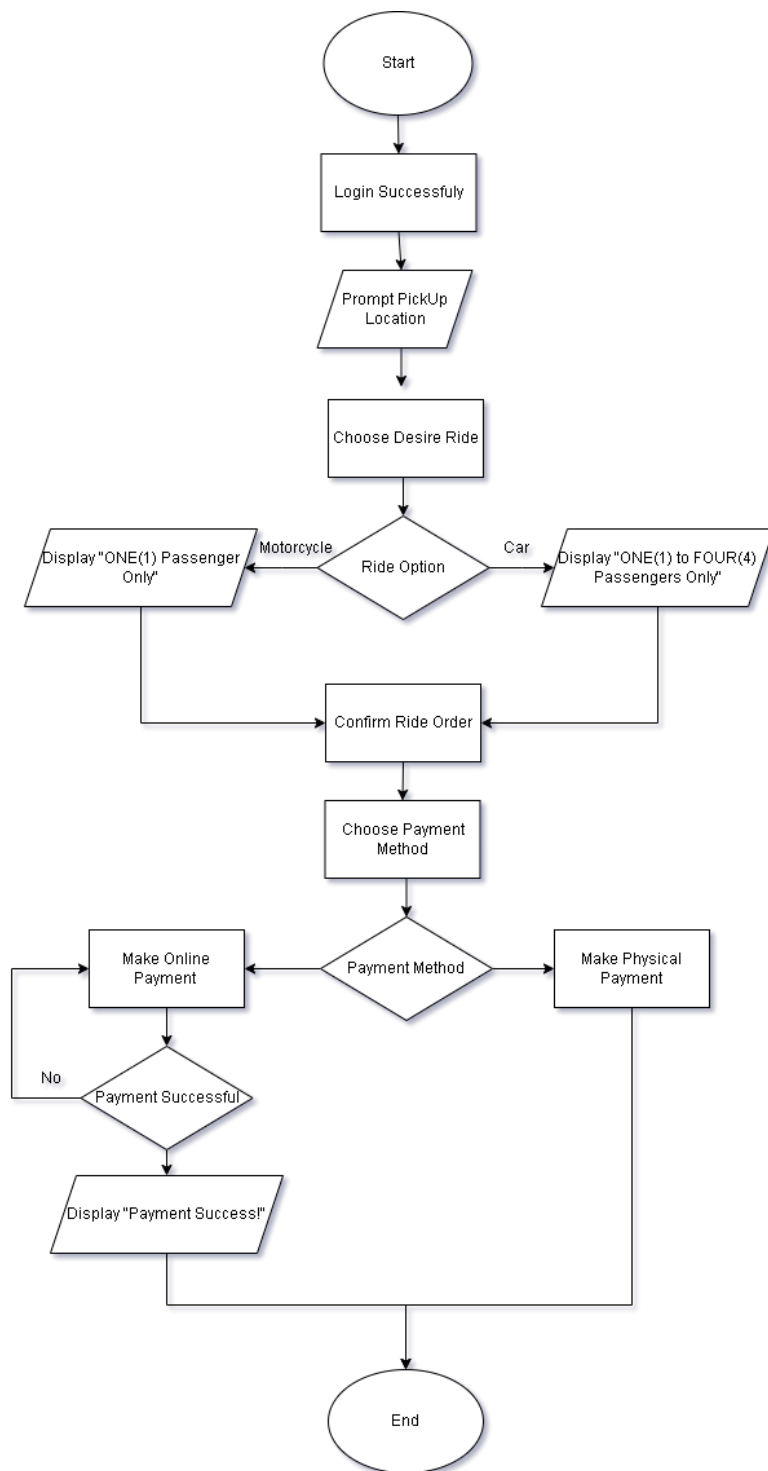


Figure 7: Flowchart 3

After successfully login with registered account, Passenger can enter their pickup location and choose where Passenger want to drop off. Once they have entered the details, the system will ask the Passenger to choose desire ride, which are motorcycle or car. Passenger can confirm the ride order and can choose the payment method as desire. There are two methods to do the payment, through online payment or cash. If online payment successfully done, the system will display, payment success message. Meanwhile if Passenger choose to do physical cash payment, the system will end there.

Flowchart 4: Driver Confirm Passenger

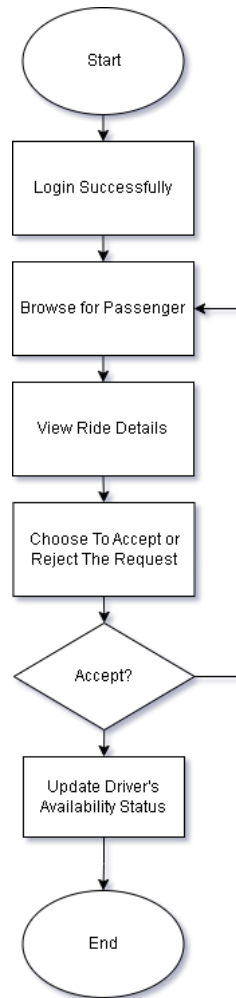


Figure 8: Flowchart 4

Starts with Driver login successfully, Driver will receive a notification if there is any request coming from Passenger. Driver can view the Passenger's details , the pickup location, desire location and so on. From that, Driver can choose whether to accept or not. If Driver has accept the request ride, system will update the Driver's availability status to "Occupied".

Flowchart 5: Driver Receive Payment

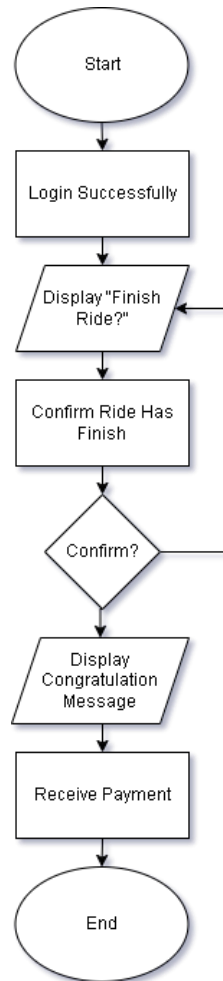


Figure 9: Flow chart 5

This flowchart shows how Driver receive payment after completing a ride request. System will display a message “Finish Ride?”. Driver needs to confirm if he/she has finished the ride and system will display congratulation message. Passenger can pay Driver through online or physical cash.

3.5 Development

In this phase of development, it will be briefly explained about the components and what the development happens in that component. The mobile application will be developed by using Android Studio and the Java programming language. The mobile application is developed for android mobile phone.

Real-Time Location Tracking: Develop real-time location tracking for both Passenger and Driver. This involves integrating with location-based services or APIs provided by Google to track the movements of drivers and provide high accuracy to pick up or drop-off information.

Security and Privacy: Develop security and privacy of user data by applying encryption of sensitive information, secure API integrations, and protection against common security threats.

Trip History: This feature is implemented into the project for passengers and drivers to see their how many trips have been done by them, while also can see how much money that they have spent on each trips.

3.6 Deployment

During deployment phase of Agile methodology, when mobile application is not deployed, customer and only few end-user representatives can give feedbacks. Due to that, can cause limited feedback which will have the rough time to improve the mobile application. On other hand, if the mobile application able to be deployed, a wide range of end-users will be using it, and feedback will be more reliable.

3.7 Project Timeline

This project timeline is to describe the duration taken for each phase. The delivery time is in weeks, to decrease the difficulties in dealing with the struggle of a student.

Requirements and Design are the only phases taken in this semester:

Other phases will be conduct through next semester.

Phase	Delivery Time (Week)																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Requirements																												
Design																												
Development																												
Testing																												
Deployment																												

Table 8: Project Timeline

3.8 Summary

In conclusion of this chapter, agile methodology able to provide an effective approach for developing a ride hailing mobile application. During the requirement phase, gather all the information needed such as hardware and software requirements in making the project. Next, in develop phase, agile methodology can deliver features such as real-time location tracking, user profile management incrementally, allowing for continuous improvement and early value delivery. After that, testing phase help in comprehensive test cases. This testing phase can identify and address any issues promptly. Lastly, the final phase is deployment. Deployment phase enabling the new features or updates in seamless manner. This can ensure the delivery to be efficient and scalability.

CHAPTER FOUR: RESULT AND FINDING

In this chapter, the project's design phase and development phase will be discussed. This chapter will also discuss the hardware and software specifications used in this project. At the end of this chapter, the whole activities done in the project will be described.

4.1 Hardware and Software Used

Hardware is an elements of a computer that is physical while software is anything that tells the hardware what to do and how the hardware will do it. They are different from each other but they also need one another in order to function properly. For example, smartphone is the hardware while software would be the operating system and the app available in the smartphone. Without the software, the phone can be consider “dead”. It wont be able to perform anything because it is not receiving any instruction. For this project, all of the hardware and software used in the developing the mobile application named “Student Ride” will be listed in this chapter.

4.1.1 Hardware Specifications

1. Laptop Lenovo Thinkpad (T470)

This hardware device is used to code mobile application. This device helps me in coding process and connecting to the database. Below is Table 4.1 that will display the specification of this hardware device.

Features	Specifications
Operating System	Windows 10 Pro
Processor	Intel® Core™ i5-6300U CPU @ 2.40GHZ 2.50 Ghz
Installed RAM	32GB
System Type	64-bit Operating System, x64 based processor

Table 9: Laptop Specifications

2. OPPO A9 2020

This device is used to run as emulator. This device has help me in seeing how the mobile application will look like on a real mobile phone.

Features	Specification
Operating System	Android 9.0 (Pie)
Battery Capacity	4880/4000mAh(Min/Typ)
Processor	SnapDragon665
Storage	128GB

Table 10: Mobile Phone Specifications

4.1.2 Software specifications

We have used software in this project in developing the mobile application, Student Ride Hailing.

1. Android Studio

Android Studio is an official integrated development environment for Google's Android operating system. Gradle-based build system is used in Android Studio to support the application development within the Android operating system. Android Studio has a lot of modalities with source code and resource files. Some of the modalities are Android app modules, Google App Engine modules and Library modules. A code editor also assist me in making this mobile application as this code editor comes form this software, offering and writing the code completion.

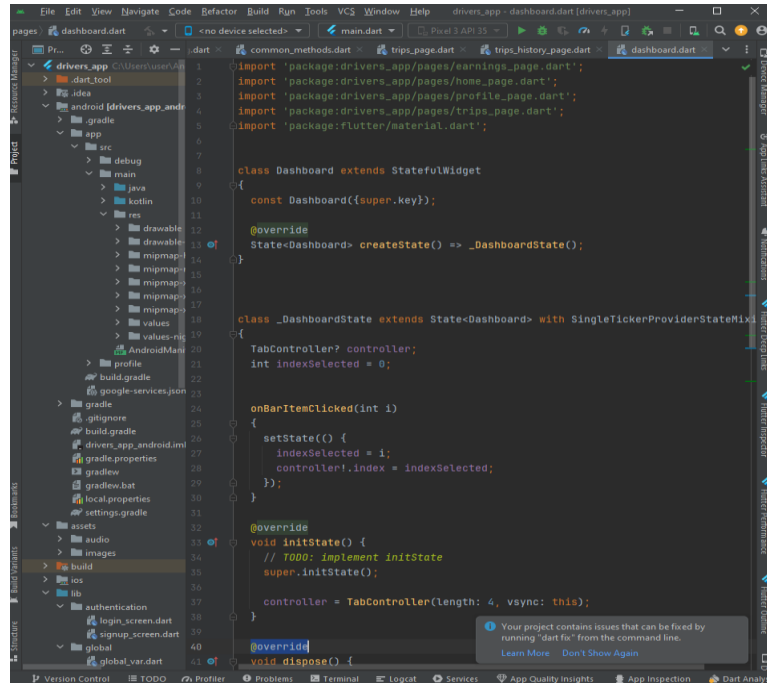


Figure 10: Android Studio for project source code

2. Fake GPS Location Spoofer 2023

This mobile application is used to test the current location of passengers and drivers. This application have been found through google app store and all the details about the application is provided there. It helped in locating the current location of drivers to pick up the passengers. This way, the formula used in this project can work properly where the distance per kilometer can be calculated. To use this application, simply choose point A and B and the app will change the latitude and longitude of the user, slowly from point A to B. The speed can be customized which can help to speed up the testing process.

This is the formula used to calculate the fare amount that passengers need to pay to drivers.

```
calculateFareAmount(DirectionDetails directionDetails)
{
    double distancePerKmAmount = 0.4;
    double durationPerMinuteAmount = 0.3;
    double baseFareAmount = 2;

    double totalDistanceTravelFareAmount = (directionDetails.distanceValueDigits! / 1000) * distancePerKmAmount;
    double totalDurationSpendFareAmount = (directionDetails.durationValueDigits! / 60) * durationPerMinuteAmount;

    double overAllTotalFareAmount = baseFareAmount + totalDistanceTravelFareAmount + totalDurationSpendFareAmount;

    return overAllTotalFareAmount.toStringAsFixed(1);
}
```

Figure 11: Formula to calculate the fare amount.

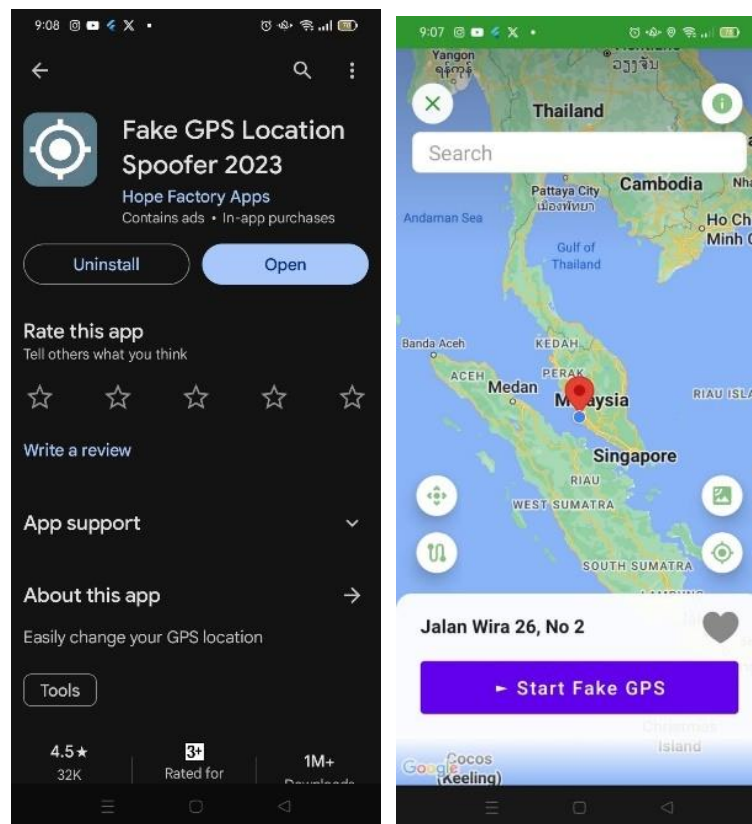


Figure 12: Fake GPS Location Spoofer 2023

4.2 Student Ride Mobile Application Interface

4.2.1 Passengers Side

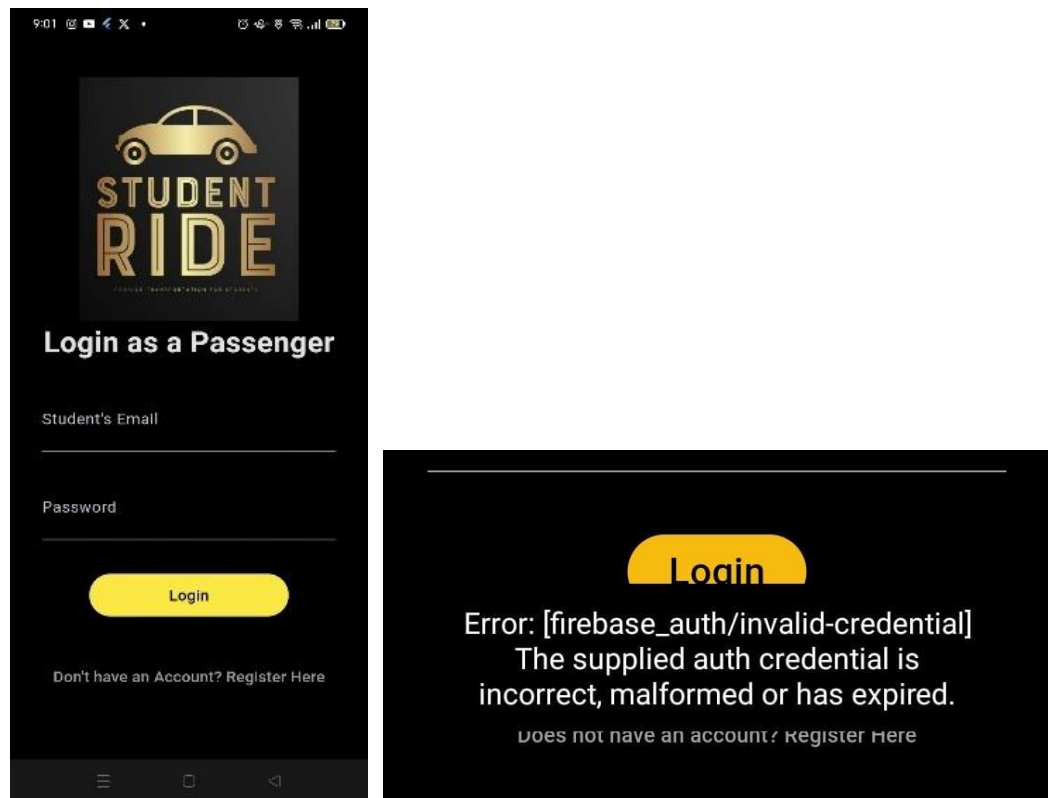


Figure 13: Login Page For Passenger

Login Page will be greeted to passengers who have not registered their account into the application. It will asked for passengers to enter their email address and password. By simply clicking on “Login” button, if passengers entered the correct/valid email address and password, they will be brought to map page. If passengers entered incorrect email or password, an error message will be displayed on screen.

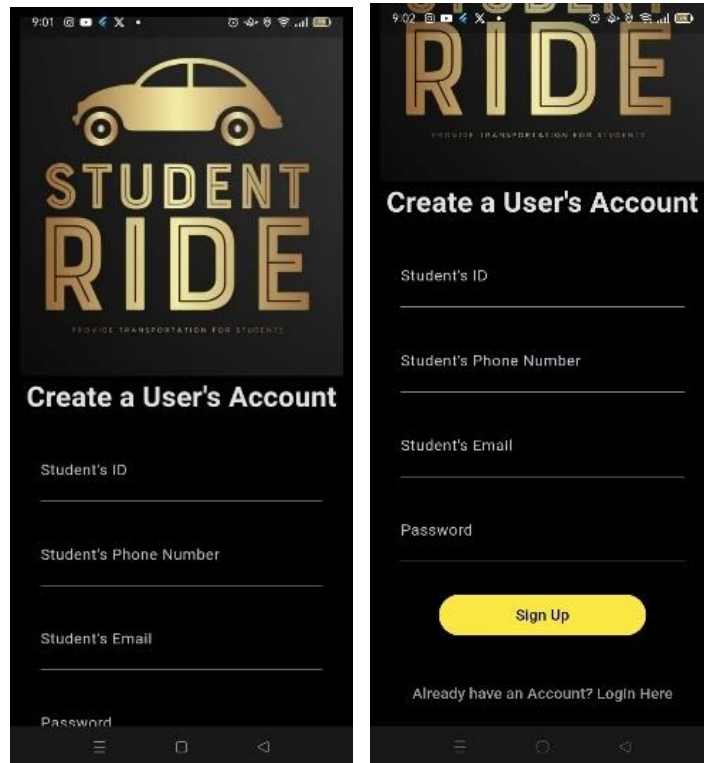


Figure 14: Register Page For Passenger

Register Page is a page where passengers can register their account into the application. Some details are needed to be able to sign up. By simply tapping on “Sign Up”, if the passengers have fill in all the requirements, passengers will successfully login straightaway to map page. Passenger will get an error message if Passenger input wrong data in the blank space. In order to register successfully, Passenger has to input correct data accordingly.

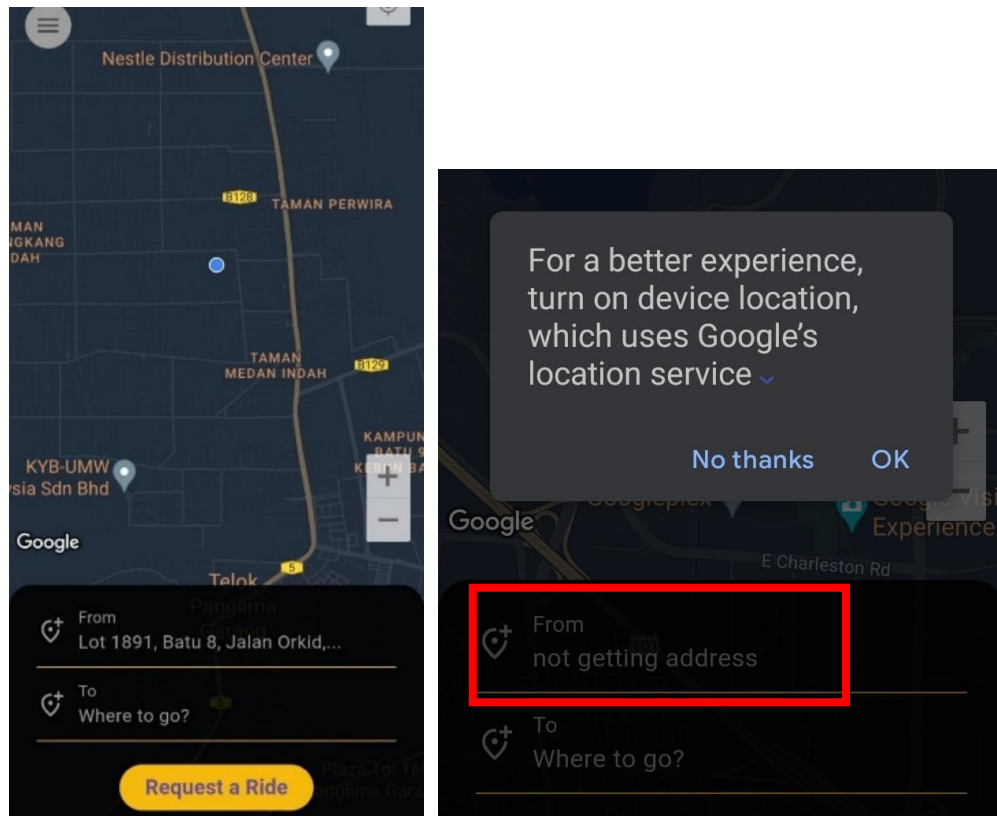


Figure 15: Map Page For Passenger

This is map page for passenger of Student Ride Hailing, it displays necessary button for passenger to interact with. This page only being displayed to passengers and driver will have a different layout as they will have different buttons. Permission to get current location will be displayed in order to get current location of passenger and the Latitude and Longitude will be stored in the database for Driver pick up process. “Not getting address” will be displayed if Passenger does not give permission and Passenger will be unable to request a ride.

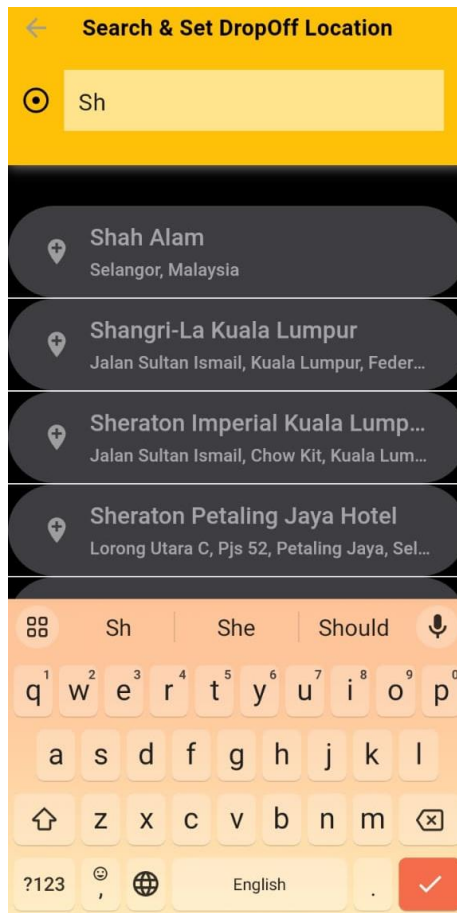


Figure 16: Search Drop-off Location Page For Passenger

In this page, Passenger will see a blank space where Passenger can tap and enter their drop-off location. There will be suggestions provided by google map Api to pin the location more accurately. The pick up location is automatically stated with the current location of the passenger.



Figure 17: Search Nearest Driver Page For Passenger

All the Driver that is in “Online” status, will be listed in this page. The car details will be shown such as the type of vehicle, the rating they had, fare amount etc. Passenger will be able to choose depending on their budget since the amount that need to be paid are different. Every vehicle type has different kind of payment. The formula used as shown:

```
static double calculateFareAmountFromOriginToDestination(DirectionDetailsInfo directionDetailsInfo)
{
    double timeTraveledFareAmountPerMinute = (directionDetailsInfo.duration_value! / 60) * 0.1;
    double distanceTraveledFareAmountPerKilometer = (directionDetailsInfo.duration_value! / 1000) * 0.1;

    //USD
    double totalFareAmount = timeTraveledFareAmountPerMinute + distanceTraveledFareAmountPerKilometer;

    return double.parse(totalFareAmount.toStringAsFixed(1));
}

getFareAmountAccordingToVehicleType(int index)
{
    if(tripDirectionDetailsInfo != null)
    {
        if(dList[index]["car_details"]["type"].toString() == "bike")
        {
            fareAmount = (AssistantMethods.calculateFareAmountFromOriginToDestination(tripDirectionDetailsInfo!) / 2).toStringAsFixed(1);
        }
        if(dList[index]["car_details"]["type"].toString() == "6-Seater") //means executive type of car - more comfortable pro level
        {
            fareAmount = (AssistantMethods.calculateFareAmountFromOriginToDestination(tripDirectionDetailsInfo!) * 2).toStringAsFixed(1);
        }
        if(dList[index]["car_details"]["type"].toString() == "4-Seater") // non - executive car - comfortable
        {
            fareAmount = (AssistantMethods.calculateFareAmountFromOriginToDestination(tripDirectionDetailsInfo!)).toString();
        }
    }
    return fareAmount;
}
```

Figure 18: Formula used to calculate fare amount.

Depends on the type have been selected by Passenger, the fare amount will be calculated using this formula.

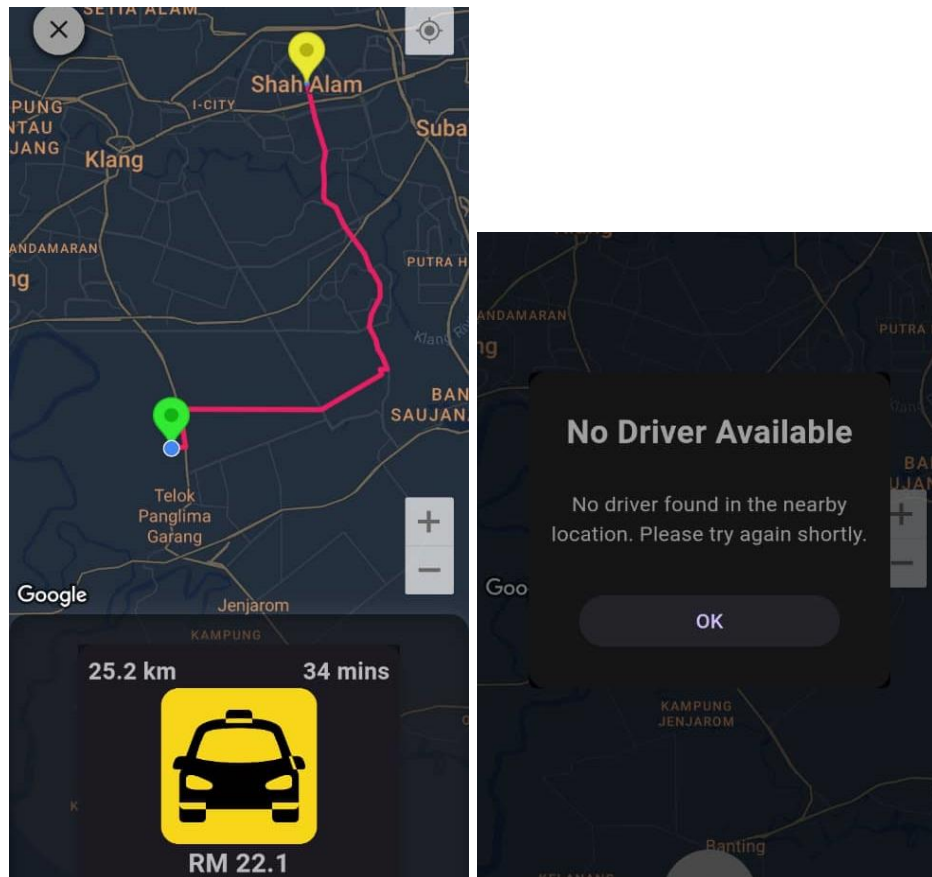


Figure 19: Confirm Drop Off Location Page

Once passengers have chosen their drop off location, the application will bring passengers to this page. This page will draw a route where passengers want to drop off. It will also display the duration of the ride, the distance from pickup location to drop off location and the amount that need to be paid by passengers to drivers.

If passenger request a ride, after 30 seconds has passed, this message will be displayed to the passenger. Due to unavailability of drivers, passengers' request cannot be completed.

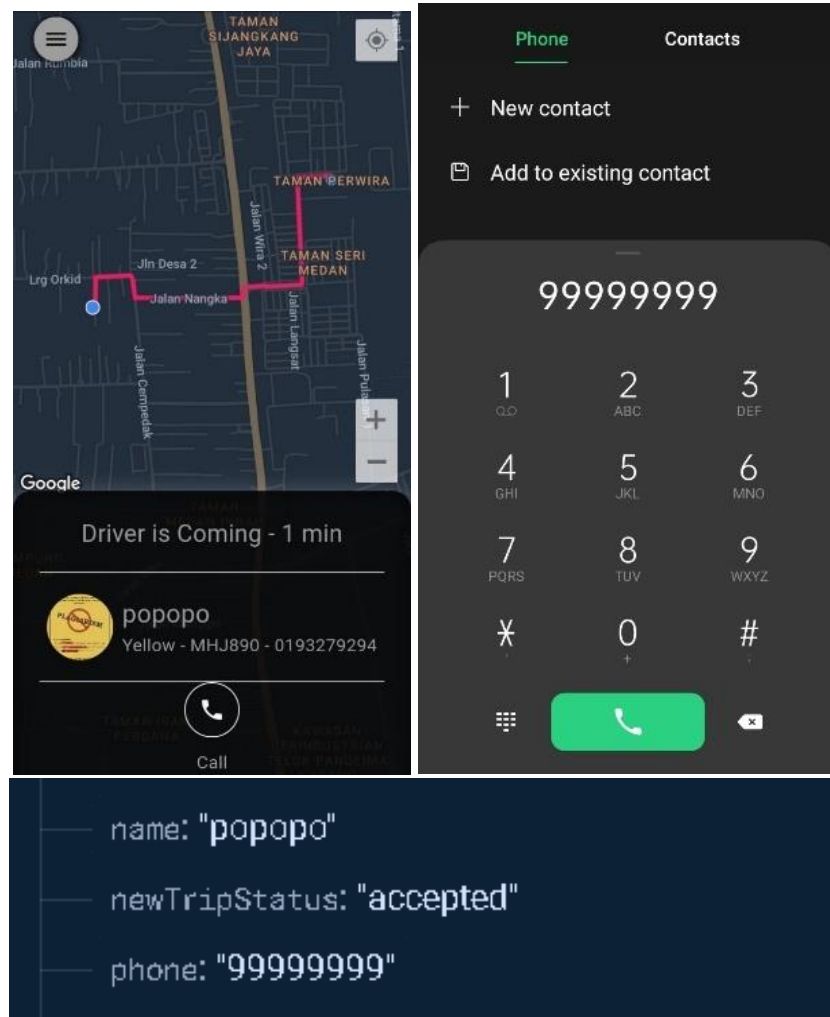


Figure 20: Accepted Requested Ride Page

This page will be displayed once any driver accepted the request ride. Passenger will be able to contact the driver using the phone number of the driver to ask any questions or give them any information needed to make the pick up and drop off process easier.

The bottom picture is shown as evidence that popopo's phone number is 99999999 and Driver cannot receive any other request if newTripStatus of Driver is "accepted" in the database.

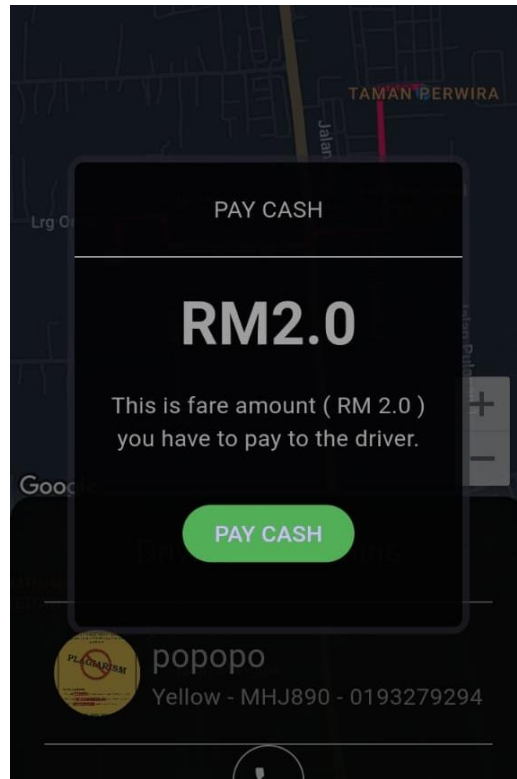


Figure 21: Pay Cash Page

After the ride has completed, drivers will tap a button where it will ends the trip. This page will be displayed to passengers. The amount that need to be paid by passengers will be displayed in this page. Once passenger, tap on “Pay Cash” button, the application will automatically reset the app, in order to not mess up the data in the database. The process of ride ends here.



Figure 22: Rating Page For Passenger

This page will be displayed after Passenger has completed the trip. Passenger need to rate the Driver and tap on "submit". This purpose to create a good environment while using the mobile application. If Driver does not be rated, they possibly behave unprofessionally and can ruin the experience of next Passenger.

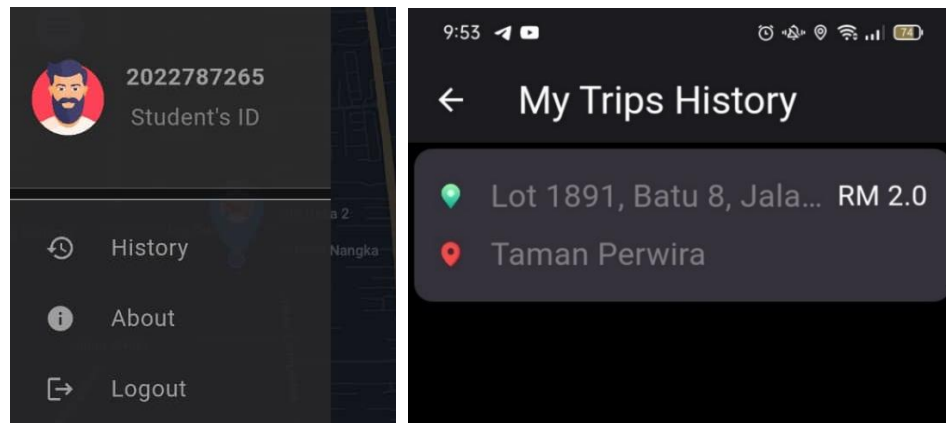


Figure 23:Trips History Page

Passengers can tap on a hamburger button on the map page left top corner, and there will be a button for passengers to see their trip history. In this page, passengers can see all the trips that have been done by them and how much have they spent in ride hailing.

4.2.2 Drivers Side

STUDENT RIDE
PROVIDE TRANSPORTATION FOR STUDENTS

Register as a DRIVER

Name & Student ID
fufu (2024515467)

Email
fufu20@gmail.com

Phone Number

Password

Next

Phone Number is required.
Already have an account? [Login here](#)

STUDENT RIDE
PROVIDE TRANSPORTATION FOR STUDENTS

Vehicle Details

Car Model

Vehicle's Plat Number

Vehicle Color

Account has been created.

Register

Figure 24: Registration Page For Driver

Similar to Passenger's registration page, with a little addition for the vehicle details. Driver need to input all the information needed to register account. Once all the information needed already filled, Driver can tap on "Register" button to complete the registration process and will be directed to the map page.

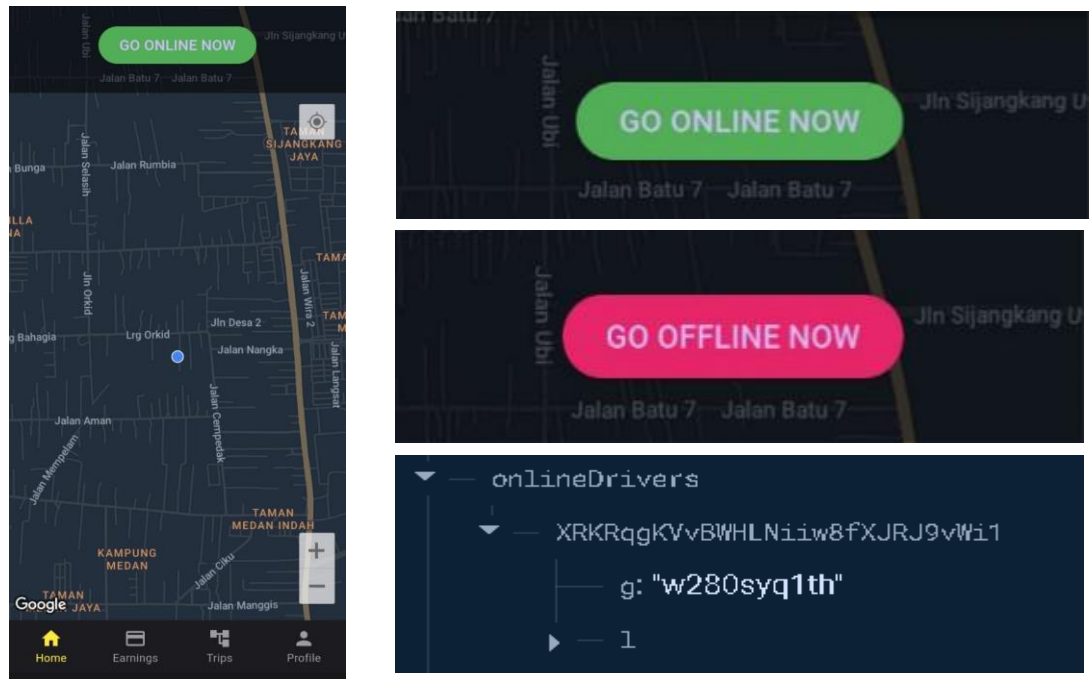
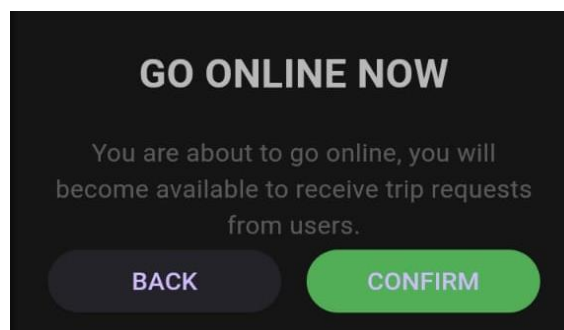


Figure 25: Map Page For Driver

Map Page will display the current location of driver on screen. While in this page, driver will be able to see few buttons such as Home, Earnings, Trips and Profile button. Each individual buttons will bring driver to certain page. “Go Online Now” will change driver’s status to be online (shown in database). After Driver have tap on “Go Online Now” button it will change to red color indicating that Driver is currently online, and Driver can easily go back offline by tap on “Go Offline Now”.



Before Driver be able to change their status to be online, Driver will be asked to confirm if they truly want to be online. By simply tap on “confirm” button, Driver is now online.

Be reminded, Driver who are online will display their location to Passenger who are looking for a ride to go to their desired destination.

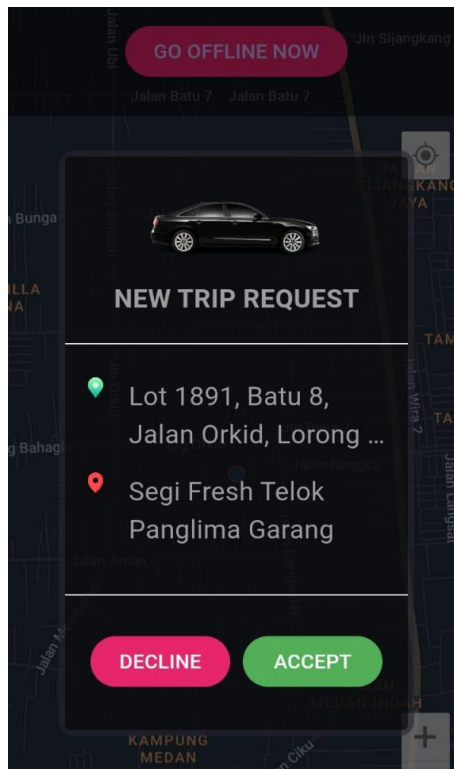


Figure 26: Accept Request Ride Page

When Passenger request a ride, Driver will get notified through push notification. If Driver not on the application at the moment, a notification will be appear and Driver can tap on it, straight to this page. A new trip request will pop-up in Driver's screen to accept or decline the request. The green pointer is pick up location while red pointer is where passenger wants to drop off.

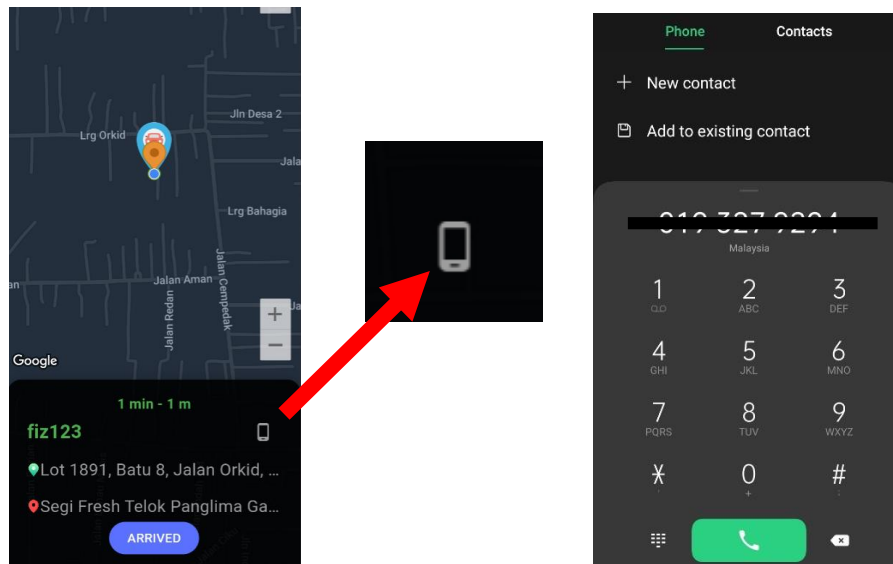


Figure 27: Arrive Page & Call phone number feature

Driver will see this page when Driver accepted the new trip request. The “Arrived” button is to notify Passenger that Driver has arrive at the pick up location. There is a button for Driver to immediately call Passenger using their phone number.

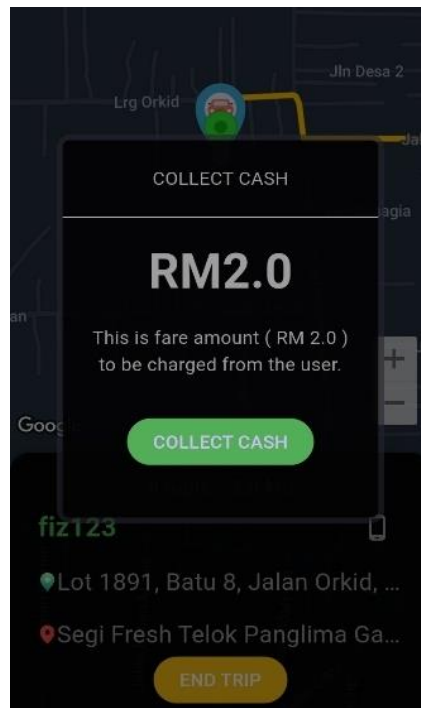


Figure 28: Collect Cash Page

Collect cash page is displayed once the trip has finished. The amount that will be received by Driver is displayed on Driver's screen. By tap on "Collect Cash" it will restart the app in order to not mess up the database. The amount will be recorded and can be seen in the "Check Trips History" page later.

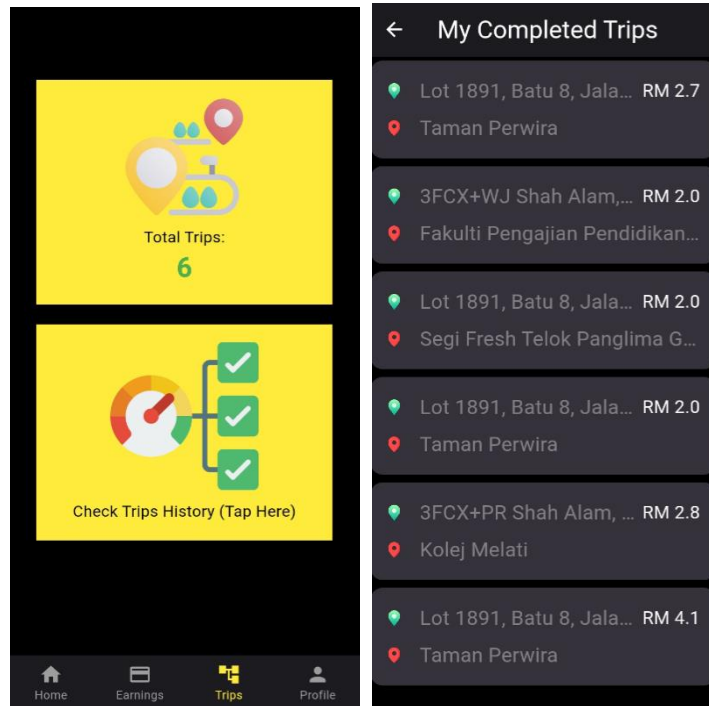
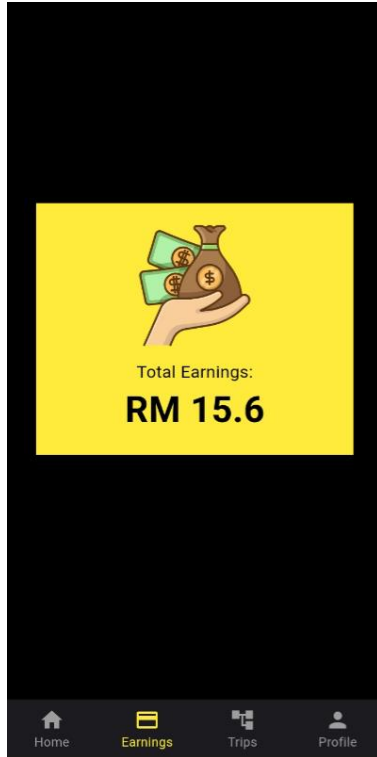


Figure 29: Completed Trips Page

Driver can see their history trips that they have done by simply go to map page, and there will be a navigation bar where there is “Trips” button. Once tap on this page, Driver can see the total of trips they have made. To see in details about the completed trips, Driver can tap on the “Check Trips History” and all the trips will be displayed on screen.



```
getTotalEarningsOfCurrentDriver() async
{
  DatabaseReference driversRef = FirebaseDatabase.instance.ref().child("drivers");

  await driversRef.child(FirebaseAuth.instance.currentUser!.uid)
    .once()
    .then((snap)
    {
      if((snap.snapshot.value as Map)["earnings"] != null)
      {
        setState(() {
          driverEarnings = ((snap.snapshot.value as Map)["earnings"]).toString();
        });
      }
    });
}
```

Figure 30: Total Earnings Page

By tap on “Earnings” button in the navigation bar at the Map Page, Driver can see the total amount that have been earn during the trips that have been done. Picture below

The picture at the right, is a formula used to collect the total of the earnings. By simply take the data “earnings” from Firebase database, this formula able to collect all the earnings from trips that have been done .



Figure 31: Ratings Page

This page is simply a page where Driver can see their performance. This rating will be displayed to Passenger. This can help Passenger to choose a good Driver wisely.





Before	After
<div data-bbox="250 1062 802 1411"> <div data-bbox="277 1073 678 1108">✕ Nearest Online Drivers</div> <div data-bbox="256 1136 792 1262">  <div data-bbox="423 1161 760 1251"> mimi (2025897665) RM 6.2 Honda CRV 30 mins ☆☆☆☆☆ </div> </div> <div data-bbox="256 1289 792 1411">  <div data-bbox="428 1304 760 1394"> fufu (2024515467) RM 1.6 Yamaha 30 mins ☆☆☆☆☆ </div> </div> </div>	<div data-bbox="948 1062 1451 1411"> <div data-bbox="976 1073 1333 1108">✕ Nearest Online Drivers</div> <div data-bbox="954 1136 1451 1262">  <div data-bbox="1101 1161 1409 1268"> mimi (2025897665) \$ 6.2 Honda CRV 30 mins ☆☆☆☆☆ </div> </div> <div data-bbox="954 1289 1451 1411">  <div data-bbox="1105 1304 1409 1394"> fufu (2024515467) \$ 1.6 Yamaha 30 mins ★★★★☆ </div> </div> </div>

Figure 32: List of Nearest Online Drivers.

Figure 32 shown the view from Passenger. Fufu has been selected by previous Passenger and has been rated 4 star. Next Passenger will be able to see the Driver's rating through the Search Nearest Driver Page. This method can be done be easily using an API called smooth star rating API.

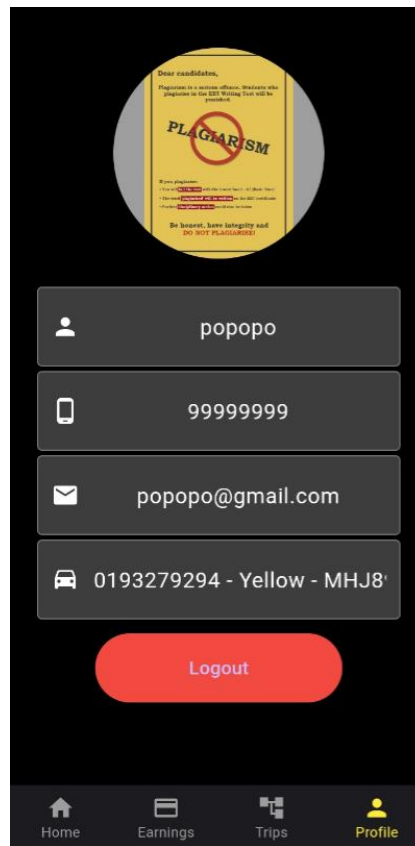


Figure 33: Driver Profile Page

Just like other pages, this page can be found in Map Page for Driver. The “Profile” button will bring Driver to this page, and all the details that have been inserted by Driver during registration will be displayed here.

“Log out” button will allowing Driver to logout from this mobile application.

4.2.3 Admin Side

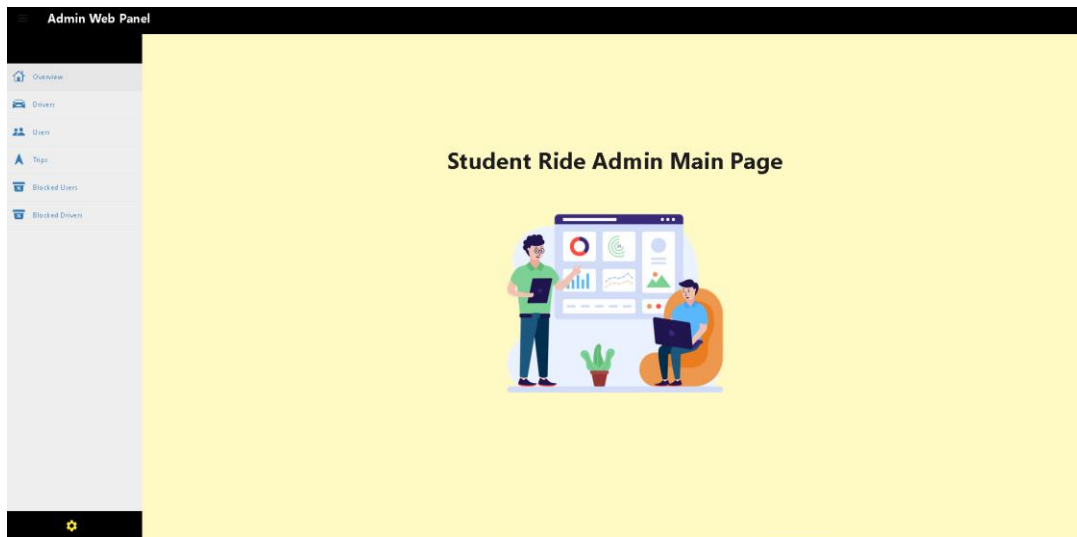


Figure 31: Default Page For Admin

Admin will be greeted by default page at the start before be able to do any action. Admin's role is to control the Passenger and Driver.

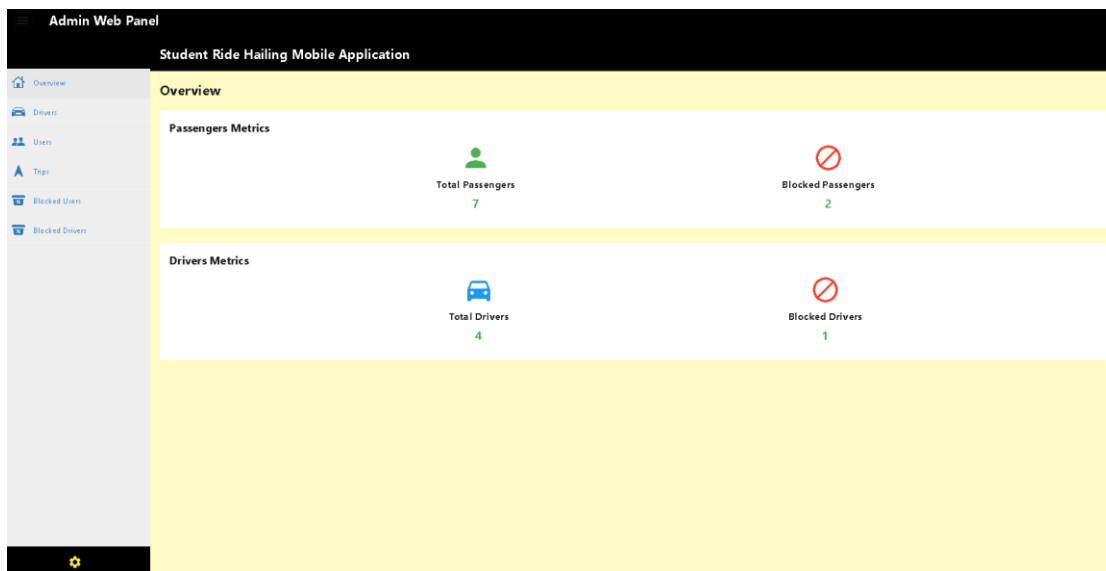


Figure 32: Overview Page

Admin will see the total number of passengers and drivers through overview page. The number of blocked passengers and drivers also be displayed here.





Admin Web Panel					
Manage Drivers					
Driver ID	Picture	Name	Vehicle Details	Phone	Action
XR0RqgKv4SVHhLNew8KURJhW1		popopo	MHJ80 - 0193279294	99999999	<button>Block</button>
YgCvXZp253onyAHurztev5a3Cl23		hafiz	CRV - CRV320	0193279294	<button>Block</button>
r7njgg5p4XEH2dhtVHqumgren1		lol123	lol123 - lol123	123456789	<button>Block</button>
xDAv54j3pFWQC5oE1EtODND2		madame Web	Hyundai - kslahdado	123456789	<button>Approve/Unblock</button>

Figure 33: Manage Drivers Page

Admin has the power to block or unblock Driver if getting any report about the behavior of Driver. Once Driver has been block, Driver no longer can log in their account and need to contact the Admin.

Admin Web Panel					
Manage Users					
User ID	Name	Email	Phone	Action	
7UMr7a4upDd2ga1pLZLBEcTHhw2	Hafiz	hafizazaan20@gmail.com	0193279294	<button>Approve</button>	
88R5JRH7x7CZ7wDjYU9gd1JA6am2	fat123	hafizazaan20@gmail.com	0193279294	<button>Block</button>	
XY5vQ1QLZbhgyW7d5bSVTRaE2	fitazaan20	fitazaan20@gmail.com	9999999999	<button>Approve</button>	
aDQyZ2q5Z9B61y9y7Gj5Gh1	lol123	lol123@gmail.com	123456789	<button>Block</button>	
hyDYG2MXAOhehz52X6QtfmMq32	lala123	lala123@gmail.com	99999999	<button>Block</button>	
oF6Q2xJNLUvY1MyGPyWFAqBm2	2022787265	nana@gmail.com	9999999999	<button>Block</button>	
QZuY1H8aM3eghHudunPBMhbxZx1	Faisal	faisal@gmail.com	999999999999	<button>Block</button>	

Figure 34: Manage Passengers Page

Same to Manage Drivers Page, where Admin has the power to block or unblock Passenger who been reported with bad behavior while using the application. Passenger who been blocked need to contact the Admin and explain with reasonable excuse to be unblock.

Admin Web Panel							
Manage Trips							
TRIP ID	USER NAME	DRIVER NAME	CAR DETAILS	TIMING	FARE	VIEW DETAILS	
-O0w6yJ1KqY_CRS6cJR	2022787265	hafiz	Yellow - CRV - CRV320	2024-07-04 16:06:27.023712	RM 2.0	View More	
-O0u64P08MTD1TAuA_uD	2022787265	loi123	red - iot123 - iot123	2024-07-04 17:34:25.436598	RM 4.3	View More	
-O1A-FlndKwMghy8_L8	2022787265	hafiz	Yellow - CRV - CRV320	2024-07-07 10:23:38.232312	RM 2.0	View More	
-O1A2uIT8Bg-KuK6Nas3	2022787265	loi123	red - iot123 - iot123	2024-07-07 10:39:38.582964	RM 22.1	View More	
-O1ACMMzG66t6v4AH6RE	2022787265	hafiz	Yellow - CRV - CRV320	2024-07-07 11:20:55.043885	RM 5.0	View More	
-O1AGI68_Uu-CV4CR8Mz	2022787265	popopo	Yellow - MHUB90 - 0193279294	2024-07-07 11:38:10.255385	RM 3.8	View More	
-O1AWQUuG6K6H56N6n	2022787265	popopo	Yellow - MHUB90 - 0193279294	2024-07-07 12:48:36.499092	RM 2.7	View More	
-O1AapUSP83-HLjigIq	2022787265	popopo	Yellow - MHUB90 - 0193279294	2024-07-07 13:12:12.961716	RM 4.1	View More	
-O1H2nqia_u866RulQM	fz123	popopo	Yellow - MHUB90 - 0193279294	2024-07-08 21:40:41.520973	RM 2.0	View More	
-O1K8u4Aik6zJNq6E	fz123	popopo	Yellow - MHUB90 - 0193279294	2024-07-09 09:40:50.248751	RM 2.0	View More	
-O1RqTmVuu6v8b7Rr	fz123	popopo	Yellow - MHUB90 - 0193279294	2024-07-10 12:14:52.003969	RM 2.0	View More	

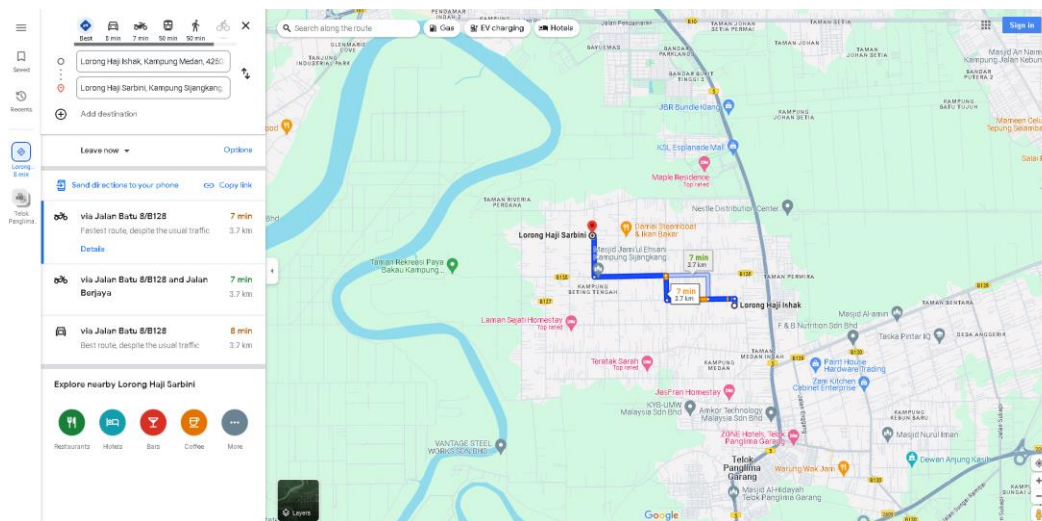


Figure 35: Trips Done Page & Route of the Trips

In this page, Admin can see all the trips that have been made. Admin also can click on “View More” button to see exactly where the trips have been done. It will bring Admin to google map to see the route taken in the trip.

(The figure below the Trips Done Page is an example when Admin clicked on “View More”.)

Admin Web Panel					
Manage Blocked Users					
USER ID	NAME	EMAIL	PHONE	ACTION	
7UMrfa4upDd82go1pJUZLBEcHkw2	Haliz	hafazaan20@gmail.com	0193279294	Approve	
XY5sQlQsZbhpyjW7d5a5VTRaE2	fizazaan20	fizazaan20@gmail.com	999999999999	Approve	

Figure 36: Blocked Passengers Page

All the blocked Passenger will be displayed in this page where it is sorted by block status. If the status is “blocked” the details of the Passenger will be displayed in this page. If Admin decide to unblock the Passenger, it will no longer be displayed in this page.


Admin Web Panel					
Manage Blocked Drivers					
DRIVER ID	PICTURE	NAME	VEHICLE DETAILS	PHONE	ACTION
xDAv5d3fWfQC5oER1EeOENID2		madame Web	Hyundai - Islandodo	123456789	Unblock

Figure 37: Blocked Drivers Page

Similar to blocked Passengers page, in this page, all the drivers who has status “blocked” will be displayed in this page. Once Admin clicked on “Unblock” button, Driver will not be in this page, and their status will be change to “no” in block status.



Figure 38: Driver's Data in Firebase Database

This is how it look like in the database, where the variable is “blockStatus”. When it shows “no” the Passenger or Driver is not blocked by Admin.

4.3 Functional Testing

In this section, there is a table that will describe how the mobile application work. For example, in the authentication part, if it successfully registered, it will bring Passenger into the map page where they can see their current location on a map using GeoFire API. On other hand, if Passenger failed to register their account by entering information that does not met the condition, the mobile application will display a message to tell them, their entered information is false.

4.3.1 Passenger Functional Testing

Topic	Success	Failed
Registration page	Passenger will be entering to the main page where their current location is displayed.	Passenger will be asked to enter correct information before be able to register successfully.
Login page	Passenger will be entering to the main page where their current location is displayed.	Error message: Passenger credential is incorrect.
Map page	Current location can be located using reverse GeoFire and Latitude & Longitude will be stored in database.	App will be asking for permission to get current location of passenger or it will display “Not Getting Address”.
Search Drop Off Location page	After Passenger has entered at least 2 letters, the predicted places will show up.	Did not show any predicted places.
Search Nearest Drivers page	If there is any drivers nearby, drivers information such as vehicle type etc will be displayed.	If no drivers nearby, a message will be displayed, telling Passenger there is no driver nearby at the current moment.
Draw route using polyline API	Pick Up and Drop Off location is needed to display the route.	Not displayed if any of the information needed not present.
Pay Cash page	Driver tap on “End Trip” on their screen for Passenger to see the page of how much they need to pay for the ride.	Driver did not tap on “End Trip”, therefore, Passenger cannot see this page.

Trip History page	All completed ride request will be displayed in the Trip History Page.	If the trip is not completed such as, Driver didn't end the trip, the trip would not appear in the Trip History.
-------------------	--	--

4.3.2 Driver Functional Testing

Topic	Success	Failed
Registration page	Driver will directed to Map page and the current location will be displayed.	Driver will be asked to complete the registration form correctly.
Login page	Driver will be greeted by Map page once successfully login.	An Error message will be displayed if Driver haven't register or entered wrong information to login.
Map page	Current location of Driver displayed and stored to database.	Different longitude and latitude will be shown to Driver and cant locate Driver's current location.
Accept Request Ride page	Driver's status will be changed to "accepted" and no longer can get notify by other Passenger's request.	Driver who tap on "Deny" will be directed to Map page.
Collect Cash page	Reset the entire app, in order to not mess up the database.	Trip status is not complete and would not be stored in Completed Trip Page.
Completed Trip page	Display all the completed trips that have been done in a list.	No list of completed trips.
Total Earnings page	The amount of earnings will be displayed in the page.	No amount of earnings displayed to Driver.
Ratings page	Ratings can be taken from the database after Passenger successfully rated the Driver.	Ratings will be set to 0.0
Driver Profile page	Display all the information that have been entered by the Driver.	Driver's information not displayed and error occurred.

CHAPTER FIVE: CONCLUSION & RECOMMENDATIONS

The main purpose of this project is to describe the project development for Student Ride Mobile Application. In this chapter, the conclusion will be presented and discuss the limitations and challenges that occur during the whole process of this project. Even though there are some good features that can be provided through the mobile application that have been developed, there will be some things that this mobile application cannot do. Recommendation is discussed in this chapter to improve and overcome the limitation.

5.1 Conclusion

The development phase of Student Ride Mobile Application by using Android Studio has been accomplished. The main target for this mobile application is students. Students in UiTM can be seen having a rough time in getting their transport to go to their desired place. There are always a few advertisements through social media such as Whatsapp and Telegram mentioning the student is making a business transport. This may be overlooked by other students to use the service that wanted to be provided by certain students who want to make money while finishing their education in UiTM Shah Alam. So, the student who wanted to do transport services had to keep announcing about the services provided through social media. This can be overcome by creating a mobile application that can collect all the datas and display it whenever the students want to do the service. Student Ride provided a button where students can easily tap 1 button to let students to be available or not. The three objectives have been successfully achieved. The mobile application manages to design a mobile application to let drivers offer their transportation services for students, second objective is map is easily understood and finally, the mobile application itself has functioned properly. Basically, this project was mainly to develop a mobile application to help students who wanted transportation services, and this mobile application can display all the drivers that are available near the student on a map.

5.2 Strength of the mobile application

All developed mobile applications must have their own strength or benefit regardless of how simple of the features provided. Student Ride Mobile Application has a few strengths that can be point out, one of them is motorcycle is one of the option available for drivers to use it as transportation vehicle. Most ridesharing or taxi mobile applications do not have motorcycles as transport vehicles. Student UiTM is known to own motorcycles and it can benefit them as they can use the vehicle as a business through this mobile application. Lastly, the strength is it is student-to-student services, as it will be handled by another student. This can ensure that students can be comfortable because the drivers are also students, like them.

5.3 Limitations

When limitations are being mentioned, the mobile application does not necessarily mean it is bad at functionality and usability. But it is a good thing to discuss as it can help to improve. Some of the limitations that have been found in this mobile application are the need for network connectivity. Since the mobile application is using firebase as the database, it needs internet to synch the data with the server. Even though Firebase can be used without Internet, the features that available is limited such as real-time updates from server, may not available until connection has been restored. That is important as ride-sharing mobile applications to track the location of the user. Lastly, due to the period to finish this project, the functionality of Student Ride may not work smoothly.

5.4 Recommendation

Recommendations can be discussed in this section. There are features that are not included such as pre-booking, food delivery etc. Those can be added into the mobile application as it can be achieved. Some mobile applications successfully managed to provide those features such as Grab and Uber. They can be a good example to enhance the ride sharing even further. As stated in limitations, mobile applications can be used without the needs of network connectivity, as it still be able to be used in offline mode.

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