

**SCHOOLTRANSPO: A MOBILE-BASED SCHOOL
CARPOOL SERVICE**

A Capstone Project presented to the Faculty of the
College of Computer Studies, University of Cebu

In Partial Fulfillment of the Requirements

For the degree Bachelor of Science in Information Technology

By

Gastador, James Vincent

Senarillos, Angel Sheen

Tugonon, Kim Jethro

Caadyang, Jonard B.

Ms. Marijoy M. Yaun

Adviser

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The Researchers
Senarillos, Angel Sheen.
Gastador, James Vincent
Tugonon, Kim Jethro
Caadyang, Jonard B.

DEDICATION

To God Almighty

To our Families

To University of Cebu - Banilad

To our Teachers and Colleagues

APPROVAL SHEET

This Research /Capstone Project Study titled **SchoolTranspo: A Mobile-Based School Carpool Service** prepared and submitted by Angel Sheen Senarillos, James Vincent Gastador, Kim Jethro Tugonon, and Jonard Caadyang has been examined and is recommended for approval and acceptance.

RECOMMENDED:

Ms. Marijoy Yaun

Adviser

Mr. Eric P. Ortega

IT Research Coordinator

APPROVED by the Examining Tribunal on ***Proposal Hearing*** with a group verdict of _____ on _____.

Ms. Moma Ortega, MCS

Chairman

Judy Ann F. Gimena, DBA

Member

Mr. Eric Ortega

Member

Mr. Rechie Ople

Member

ACCEPTED and APPROVED in partial fulfillment of the requirements in Bachelor of Science in Information Technology.

Ms. Moma D. Ortega

Dean, UC – CCS

Date: _____

TABLE OF CONTENTS

	Page
TITLE PAGE	i
ACKNOWLEDGMENT	ii
DEDICATION	iii
APPROVAL SHEET	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
CHAPTER I: INTRODUCTION	
Rationale of the Study	1
Objectives of the Study	2
Scope and Limitations of the Study	2
Significance of the Study	3
Flow of the Study	4
Definition of Terms	5
CHAPTER II: REVIEW OF RELATED LITERATURE AND STUDIES	
Related Literatures	6
Related Studies	7
Comparative Matrix	8
CHAPTER III: RESEARCH METHODOLOGY	
Software Engineering Methodology	10
Planning/Conception-Initiation Phase	12
Business Model Canvass	12
Program Workflow	13
Validation Board	17
Gantt Chart	18
Functional Decomposition Diagram	21
Analysis-Design Phase	22

Use Case Diagram	23
User Interface Design	24
Storyboard	52
Database Design	56
Entity-Relationship Diagram	60
Data Dictionary	61
Network Design	65
Network Model	65
Network Topology	65
Development/Construction/Build Phase	65
Technology Stack Diagram	65
Program Specification	67
List of Modules	68
Testing/Quality Assurance Phase	70
Unit Testing	70
Integration Testing	73
Alpha Testing	74
Acceptance Testing	76
Implementation/Deployment Phase	77
Implementation Budget/Cost Specification	77
Hardware Specification	77
Software Specification	78
Human Resource Specification	78
User Guide	78
Installation Guide	89
Project Roadmap	90
CONCLUSION	91
RECOMMENDATIONS	91
REFERENCES	92
APPENDICES	
Appendix A – Transmittal Letter – LTFRB	93

Appendix B– Consultation Log	94
Appendix C – Censor’s Certificate	95
Appendix D – Guide Questions	96
TEAM PROFILE	99

LIST OF TABLES

Table		Page
1	COMPARATIVE MATRIX	8
2	BUSINESS MODEL CANVAS	12
3	VALIDATION BOARD	17
4	GANTT CHART	18
5	USER FILE	56
6	VEHICLE FILE	57
7	CARPOOL FILE	58
8	SUBSCRIBER FILE	58
9	ADMIN FILE	59
10	FEEDBACK FILE	59
11	USER DETAIL FILE	61
12	VEHICLE DETAIL FILE	62
13	SUBSCRIBER DETAIL FILE	63
14	ADMIN DETAIL FILE	64
15	FEEDBACK DETAIL FILE	64
16	LIST OF MODULES	68
17	UNIT TESTING – USER	70
18	UNIT TESTING – OPERATOR	71
19	UNIT TESTING – DRIVER	73
20	INTEGRATION TESTING	73
21	ALPHA TESTING	74
22	COST SPECIFICATION	77
23	HUMAN RESOURCE SPECIFICATION	78

LIST OF FIGURES

Figure		Page
1	Flow of the Study	4
2	Agile Methodology	10
3	User Program Workflow	13
4	Operator Program Workflow	4
5	Admin Program Workflow	16
6	Functional Decomposition Diagram	21
7	Use Case Diagram	23
8	Welcome Screen	24
9	Registration	25
10	Login	26
11	Passenger Homepage	27
12	Passenger Search Carpool	28
13	Passenger Profile Navigation Drawer	29
14	Passenger Subscribe Carpool	30
15	Passenger Subscribed Carpool	31
16	User View Profile	32
17	User Edit Profile	33
18	Driver Homepage View	34
19	Driver View Profile	35
20	Driver Edit Profile	36
21	Driver View Vehicle Details	37
22	Driver View Operator Info	38
23	Driver View Passenger List	39
24	Operator Homepage	40
25	Operator Passenger Request	41
26	Operator Profile Navigation Drawer	42
27	Operator View Profile	43
28	Operator Edit Profile	44
29	Operator Add Driver	45

30	Operator Add Carpool	46
31	Operator View Carpool Details	47
32	Operator Assign Driver	48
33	User Payment Method	49
34	Feedback	50
35	Admin Homepage	51
36	User Storyboard	52
37	Operator Storyboard	53
38	Driver Storyboard	54
39	Admin Storyboard	55
40	Entity Relationship Diagram	60
41	Network Topology	65
42	Technology Stack Diagram	66
43	Project Roadmap	90

CHAPTER I

INTRODUCTION

In today's society most parents are workers and Parents living in the city are mostly busy with their job and it is difficult for them to drop off their children to school. As we are living in the digital era, we want to contribute a solution to this problem in our society and provide I.T. solutions to this problem. This studies aim is to provides carpool services and monitors school carpools, as it shows the available carpool for every school and the route it is going to take and to drop the student. This will lessen the problems of parents dropping off their children to school.

Rationale of the Study

Being as the vehicles used for carpool is not owned by the school it is not guaranteed to be safe, so we implemented a GPS tracking on our system to know the location of the carpool to make it a bit safer. Recently due to both parents often work at the same time. they can be too busy to take their children to school. To solve this problem, we propose a carpool system dedicated to a school and have the parents pay the school semester subscriptions.

While many solutions to these problems have been proposed, carpooling is one of the most effective solutions to these problems recently, several carpooling platforms have been built on cloud computing systems, with originators posting online list of departure/arrival points and schedules from which participants can search for rides that match their needs.

As a result of technological advances such as the development of smart hand-held device software and hardware, along with mobile Internet technology, the website-based carpool system has become more advanced and is now appropriately referred to as the intelligent carpool system (AICS). Through the use of smart hand-held devices with Global Positioning System (GPS) navigation and mobile communication ability, drivers and passengers can instantaneously access real-time carpool service via the structure of AICS,

with their current locations and other required information input by their smart phones, tablet computers, or other devices.

Objectives of the Study

This study aims to develop a mobile-based application system that will provide carpool service for students and school staffs for commercial use.

In order to achieve this aim, the specific objectives are:

1. to gather data about carpooling process;
2. to determine the mechanics to track the vehicles location and safety; and
3. to define a notification scheme for the parents.

Scope and Limitations of the Study

In this study, the application must be connected to the internet connection to properly use the features of the app. Connecting to the internet is essential because the data that the app will be retrieving comes from the cloud database to give real-time update to its users.

Passenger/s needs to register and subscribe to the carpool service app so the passenger/s can use the carpool service and be able to go to school and go home any time as long as the user is subscribed to the carpool service app.

It uses a machine learning that weighs the comments and the rating of the carpool driver to determine the top-rated driver

Before the passenger/s can be picked up, the passengers must turn on their GPS so the carpool driver will know where to pick up the passenger/s and when the carpool driver is near it will send a notification to the passenger/s and when the carpool arrive to the school it will notify to the passenger/s that the passenger/s has arrive at the school.

The scope of the project will be only at Schools and the limitation is that the application can't really guaranty the safety the passenger/s, because the app can't prevent the accidents happens on the road and it is limited only in Cebu.

The application is limited only to some Android version mobile devices and won't run on any iOS mobile devices, it can't track the students if the school doesn't allow phones. The operator must have his own garage for the vehicle, a Filipino citizen, and financially capable.

The vehicle must be brand new or not more than 3 years since registration, vehicle must be either a van or bus and should be colored yellow with the name of the school printed on the vehicle. All carpool vehicle must have cctv/dashcam, first aid, and fire extinguisher. Carpool services are strictly for one school except if the other school is within a 200 meters radius from each other.

Significance of the Study

This study aims to provide ease and comfort to all its stakeholders imposing a positive impact on society as a whole. The outcome of the study is beneficial to the following stakeholders:

Operators. The application will serve as a platform where school carpool operators are able to pick up passengers that are within their routes.

Passengers. Through the application, they will be able to keep track of the school carpools and their routes, so that they will know where the pickup point and their destinations are. This defines the students and the school staffs.

General Public. The general public will be able to take this as a reference and will benefit as to lessen transportation problems towards certain destinations.

Researchers. The researchers will benefit from this study because the study helps improve communication skills, develop teamwork, and gain knowledge and experience for future references.

Future Researchers. Future Researchers will acquire huge amount of knowledge from this study which would help them in any future endeavors.

Flow of the Study

This diagram shows the different inputs, the processes that these inputs will undergo to produce the needed information and the output of the study.

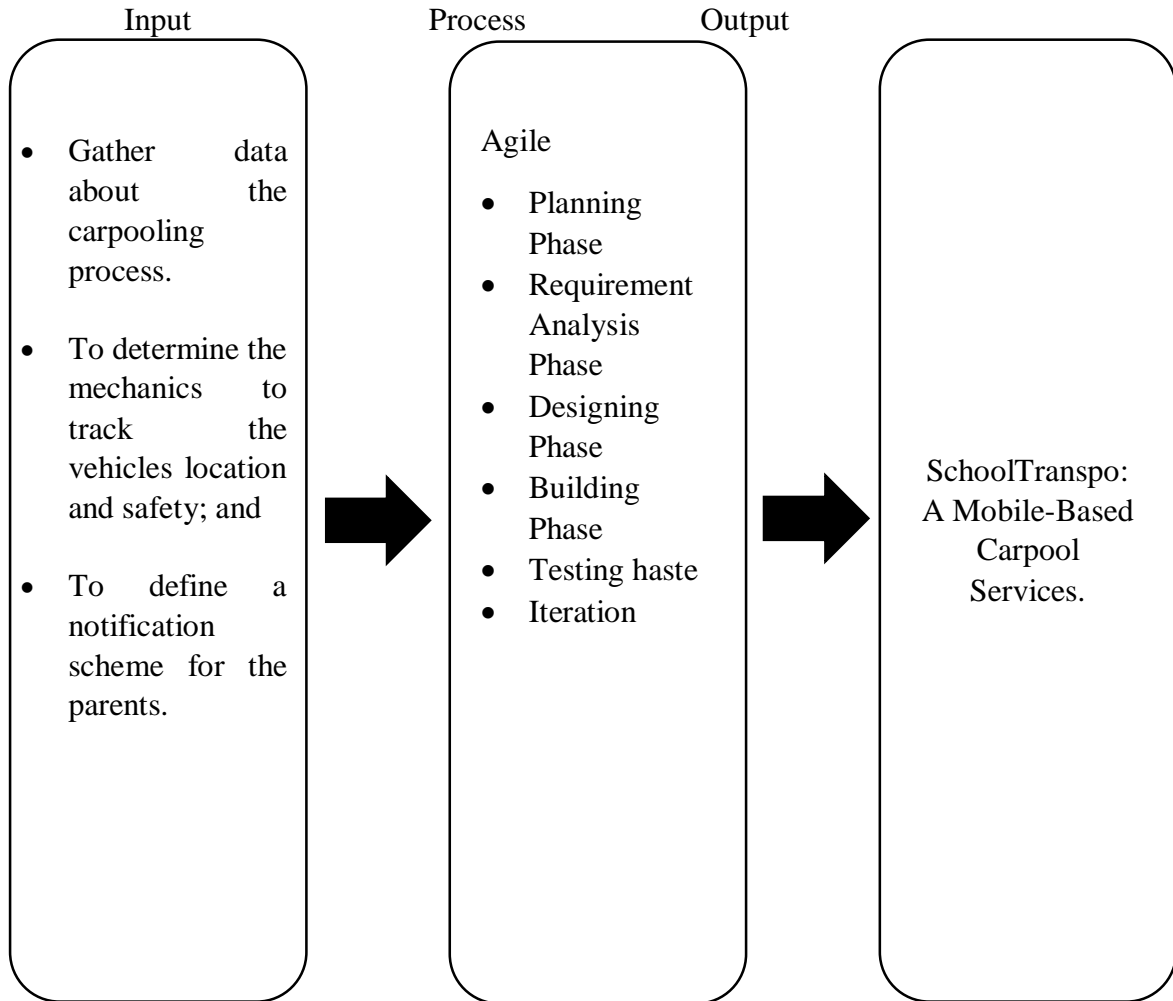


Figure 1: **Flow of the Study “SchoolTranspo”**

Figure 1 illustrates the flow of the study. The input consists of the requirement that is needed for the application to properly work to its expected performance, it presents the needed data and requirements of the system. The process, on the other hand, presents what the data will undergo to produce the necessary information. Lastly, the output is the application that will result after the inputs have been processed.

Definition of Terms

Some words found in this study have special meaning and usage. The operational definitions of these words are providing for better understanding of the study. The following are the terms used in the study and are define according to their functions.

Carpools – the primary element of the study. These are tracked down and monitored in the study.

Filtering – is a process of evaluating the attributes of an object and recommending/choosing just those whose attributes match the users' preferences.

Notification Scheme – a process of notification that defines who is notified, when they are notified, and how notifications are sent.

Tracking – To track the carpools available in the area of destination.

Users – Define as the passengers of the carpools.

School staffs – Also defines as the passengers of the carpools.

CHAPTER II

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents related literatures and related studies similar to the “SchoolTranspo: A mobile based school carpool services”. The related study contributes to the development of the proposed system by identifying features from existing studies and apply and improve the proposed system.

Related Literature

Transportation has been one of the major problems that commuters has encountered. Traffic congestion has been a serious problem in many urban areas around the world. Carpooling is one of the most effective solutions to traffic congestion. It consists of increasing the occupancy rate of cars by reducing the empty seats in these vehicles effectively (Yeh et al., 2015). Yet parents working full time may not be able to respond to the transportation needs of their children, which is why parents may have to find carpools for their kids.

With the use of global position system (GPS) and its location tracking abilities, it may be easier for us to track and locate the positioning of the carpools as well as the passengers with their handheld mobile devices. Global positioning system has been commonly used in some of the business industries nowadays. According to the authors of the book entitled “Positioning Systems in Intelligent Transportation Systems“, it is said that positioning systems, which determine the location of cars, trucks, buses, trains, and airplanes, are critical in the use of intelligent transport systems (ITS) to improve the efficiency and safety of transport systems while making them less congested and less polluting (Drane & Rizos, 1998).

Using a location-based service (LBS) it may be easier to extract the data on the right place and right time for both of the passengers and the drivers. Location-based services uses global positioning system in order to be utilized. LBS applications aim to

provide real-time service, such as route planning, point of interest selection etc. (Meng, Zipf, & Reichenbacher, 2005).

Term frequency-inverse document frequency (TF-IDF) is also used for weighing the scores and reviews in most applications. This will be used in order to rank the scores of the driver's performance so that passengers would feel at ease to travel along with the driver. Ranking features are generated by the interactions between the two representations, incorporating information from the word space, the entity space, and the cross-space connections through the knowledge graph (Xiong, 2017).

The related literatures represents that these existing systems will be used in order to develop "SchoolTranspo", to provide a better transportation experience and service towards the students and school employees through carpooling.

Related Studies

Waze is a GPS navigation software that uses crowdsourcing to provide traffic Information to its users. Waze collects map data, travel times and traffic information from users. Users can also report the status of the traffic on certain areas to notify other users who wishes to travel through the same route. Waze also has a carpool application called "Waze Carpool", which has the same features from the Waze application, but with a ride-sharing feature. Waze Carpool also lets its users to choose to drive or ride with people along the way, which is stated by the company's website.

Grab is a taxi hailing application, it assigns taxis and private hire cars to nearby commuters through a location-sharing system. Grab is the biggest ride-hailing firm in Southeast Asia, and has strengthened its hold on the market since buying US rival Uber's operations in the region last year(Agence France-Presse, 2019). Grab application auto detects the user's location through global positioning system (GPS) for pick up purposes, although the application will have to require users to turn on the location settings in their mobile device. Grab app allows the users to rate the driver's performance for feedback purposes to avoid issues between the drivers and the passengers.

Micab is also a taxo hailing application similar to Grab, where user's can easily book taxis through a location-sharing system. It was originally designed to be a Short

Message Service (SMS) based taxi hailing solution, but eventually turned to mobile application. Micab also allows users to rate drivers, same as Grab. The only difference between the two is that Micab are only focused on taxi companies/operators. According to Ybañez (2017), Micab is similar to Uber and Grab in terms of application, but they differ in the business model. Unlike Uber and Grab, Micab does not directly deal with drivers, but it engages with “premium taxi companies” and provides them an app-based system to dispatch units.

The related studies represents that these existing applications were comparable to the study. These applications has their own unique features to provide the needs of the end users.

Comparative Matrix

This section indicates the tables of the related studies that have the same reference and tools we are using on the progress of this study.

Table 1

Comparative Matrix

<u>Related Studies</u>	<u>Features</u>	<u>Limitation</u>	<u>Platform Details</u>	<u>Support</u>
Name: Waze Carpool URL: https://www.waze.com/carpool Proponent(s): 1. Waze Mobile Ltd. 2. Google Inc.	<ul style="list-style-type: none"> Provides routing and real-time traffic updates. Waze also allows registered users to modify the map data itself through the Waze Map Editor. 	<ul style="list-style-type: none"> Only limited to US, Brazil, Israel, and Mexico. Requires mass users to report the traffic updates. Requires internet connection to keep track of the traffic updates. Relies on information from state agencies for traffic events such as road construction. 	Waze Carpool supports Android and iOS platforms.	- Java Programming Language

Table 1.1
Comparative Matrix cont'd

Name: GrabShare URL: https://www.grab.com/ph/transport/share/ Proponent(s): 1. Grab Holdings Inc.	<ul style="list-style-type: none"> • This app auto detects the user's location and sets it as your pick-up. • Grab also allows the user to rate the driver for performance purposes. 	<ul style="list-style-type: none"> • Requires internet connection in order to book a ride. • Can only bring up to 1 friend for the ride. • GrabShare option is only available on minimum app version v5.52.1. 	GrabShare supports Android, iOS and Windows Phone platforms.	- Java Programming Language
Name: MiCab URL: https://www.micab.co/ Proponent(s): 1. Eddie Ybanez 2. Kenneth Baylosis	<ul style="list-style-type: none"> • This app auto detects your location and sets it as your pick-up point. • Micab also allows the user to rate the driver for performance purposes. 	<ul style="list-style-type: none"> • Requires internet connection in order to book a ride. • Does not support Android Pie and above versions. 	Micab supports Android 8.1 and below, iOS and Windows Phone Platforms	-Java Programming Language

Table 1 shows the comparative matrix of related studies regarding tracking and monitoring systems and also carpooling services. This shows the titles of the different related studies with their corresponding features and limitations which are used as a reference in developing the application enabling the researchers to exceed these applications and to meet the objectives of the study. Some features will be applied in the SchoolTranspo application.

CHAPTER III

RESEARCH METHODOLOGY

This section shows the gathered data analytics and software engineering methodology to be used in the study to be proposed. The technical specifications are defined in this chapter and diagrams are shown for better understanding. This section also contains the business model canvas, functional decomposition diagram, the designs like the user interface designs and database design to give a clear view of the functionalities of the proposed study.

Software Engineering Methodology

Our team decided to use the agile methodology. This method allows us to be flexible with our development and separate them into modules. Agile methodology lets us work on the application's in each phase over and over again until we finish the development. This helps the developers have hands on with each module and can get user feedback for future improvements.

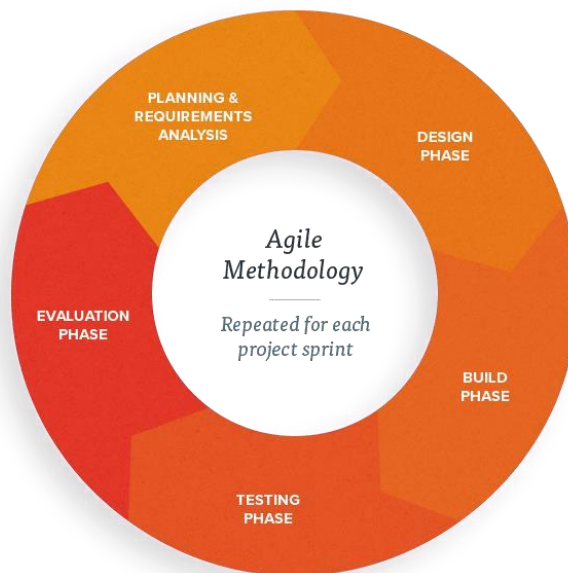


Figure 2: **Agile Methodology**

Figure 2 shows the different phases of agile development. It starts from planning phase down to the evaluation phase. Agile methodology is known to adopt changes. If the team decides to make changes, it will be made in the next iteration. Each phase has its own function and contribution to the development of the “SchoolTranspo” application.

Planning. This is where the researchers plan and set all modules to be assigned to each team members for the development of the system. the team will identify what are the objectives, requirements, and resources needed for development. This is also where the team will have to deal with issues that need to be addressed. The team tasked to understand what the project is about and discussing to each other concepts and ideas that will benefit the project. The project manager will assign a task to each of the team members in order to manage the time and meet the expected task schedule.

Requirements Analysis. This phase is where data will be processed and gathered to complete the final output. The team will gather data from articles, surveys and interviews, specifically from students, parents and carpool owners. Additional data such as map features can help in making the product.

Designing. This phase will have the team develop the front end and the back-end of the system. The front end mainly focuses on the User Interface that helps users navigate with ease and not be overwhelmed with information on one panel. The back end will be dedicated for the database design.

Building. This phase will be the execution of the plans and designs. Here we do the programming, testing, and debugging. It is very important in this phase that each team member will cooperate in creating the system as to not let the entire system fail. The lead programmer will be in charge in naming all the variables, classes, functionalities, etc. as to not confuse the programmers while coding.

Testing. This phase is where the developers try to run their system and check whether or not if its fully functioning, bug free, useable, and up to quality standards. The developers will have to make sure that the system is running smoothly so it won't cause problems during deployment. This phase will also need user testing and their feedback.

Evaluation. This phase will be where the product will be deployed to the users as a finished output. all issues, bugs, malfunctions, user feedbacks will be gathered for future improvements and to make the overall product better.

Planning/Conception – Initiation Phase

This phase is first phase in the project management life cycle. This is where decisions regarding the project is made.

Business Model Canvas

The Business Model Canvas is a visual representation of current or new business models.

Table 2

BUSINESS MODEL CANVAS

KEY PARTNERS	KEY ACTIVITIES	VALUE PROPOSITION	CUSTOMER RELATIONS	CUSTOMER SEGMENTS
- Government Agencies (LTFRB, Dep ED) -Schools (Private, Public)	- Carpool service	- Helps school carpool operators find passengers for the school (student, employee) - Provide tracking and monitoring of the vehicle for the users - Provide platform for school carpool service	- Personal Assistance - Self Service	- Carpool Passengers - Carpool Operators
	KEY RESOURCES		CHANNELS	
	- Developer - System Designer - Database Designer - Smartphones		- Android application	
COST STRUCTURE		REVENUE STREAMS		
- Development cost - Marketing cost		- Advertisements - Subscription		

Table 2 illustrates the system's Business Model Canvas. The Business Model Canvas is a strategic management tool to quickly and easily define and communicate a business idea or concept. These building blocks are key partners, key activities, value propositions, customer relationships, channels, customer segments, cost structure, and revenue streams.

Program Workflow

The program workflow shows the flow of the processes in the application to fully understand how the entire program works.

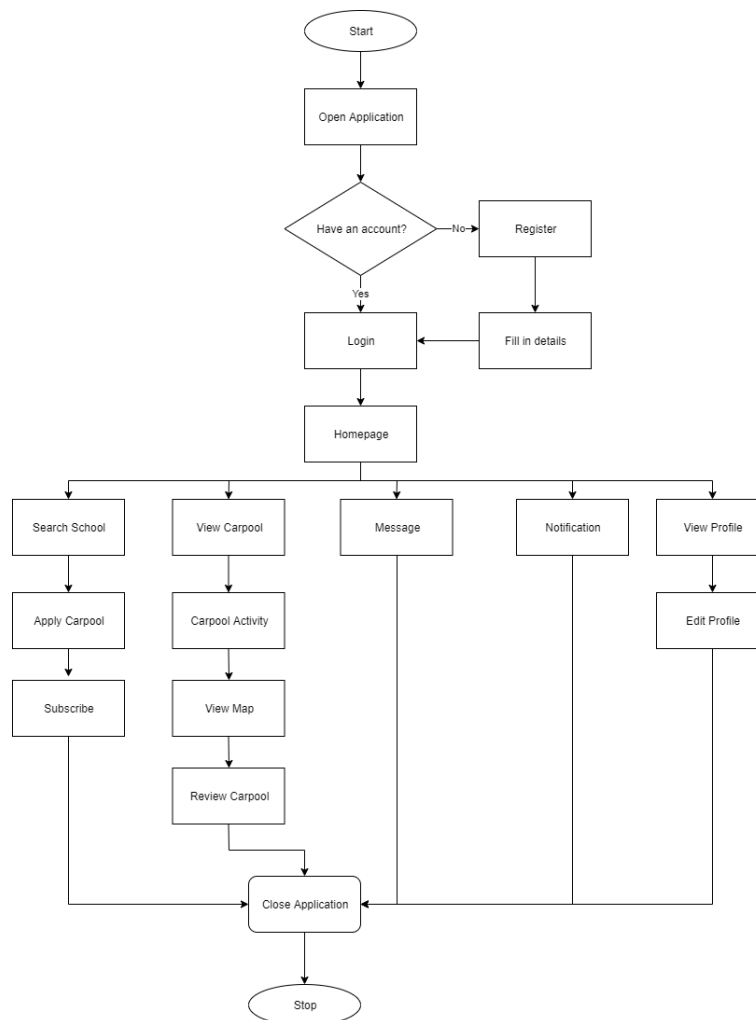


Figure 3: User Program Workflow

Figure 3 illustrates the workflow of the users. It shows the sequence of activities that the passengers can do in the system. The passenger opens the application.

If the user doesn't have an account, he/she will need to register and fill in the user details to be able to log-in. After logging in, the user then searches for the school he/she is attending and apply for a carpool service, the carpool can be viewed, tracked and given reviews for other users to see.

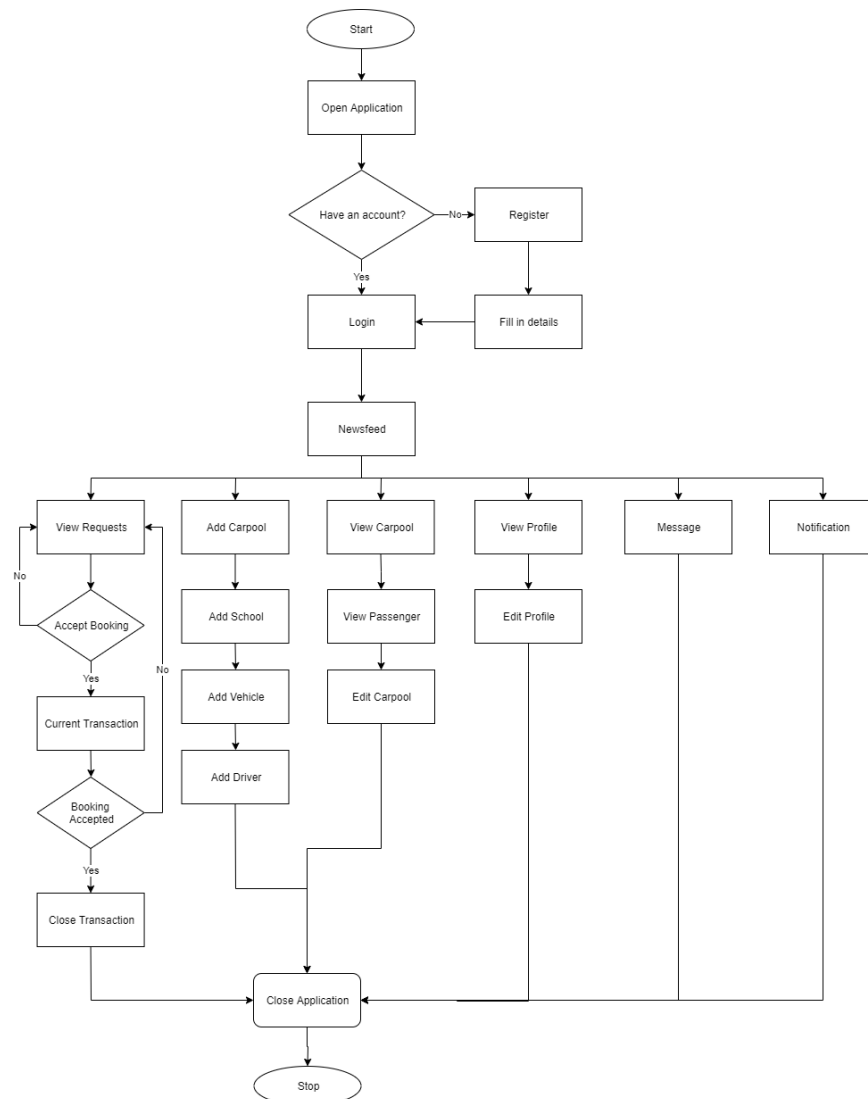


Figure 4: **Operator Program Workflow**

Figure 4 illustrates the workflow of the operator users. It shows the sequence of activities that the operator can do in the system. The operator opens the application.

If the operator doesn't have an account, he/she will need to register and fill in the user details to be able to log-in. The operator will need to add his/her carpool service with vehicle and driver details and the school it is assigned to. The operator can view passenger requests where he/she can either accept or decline the request. Carpool details can be edited.

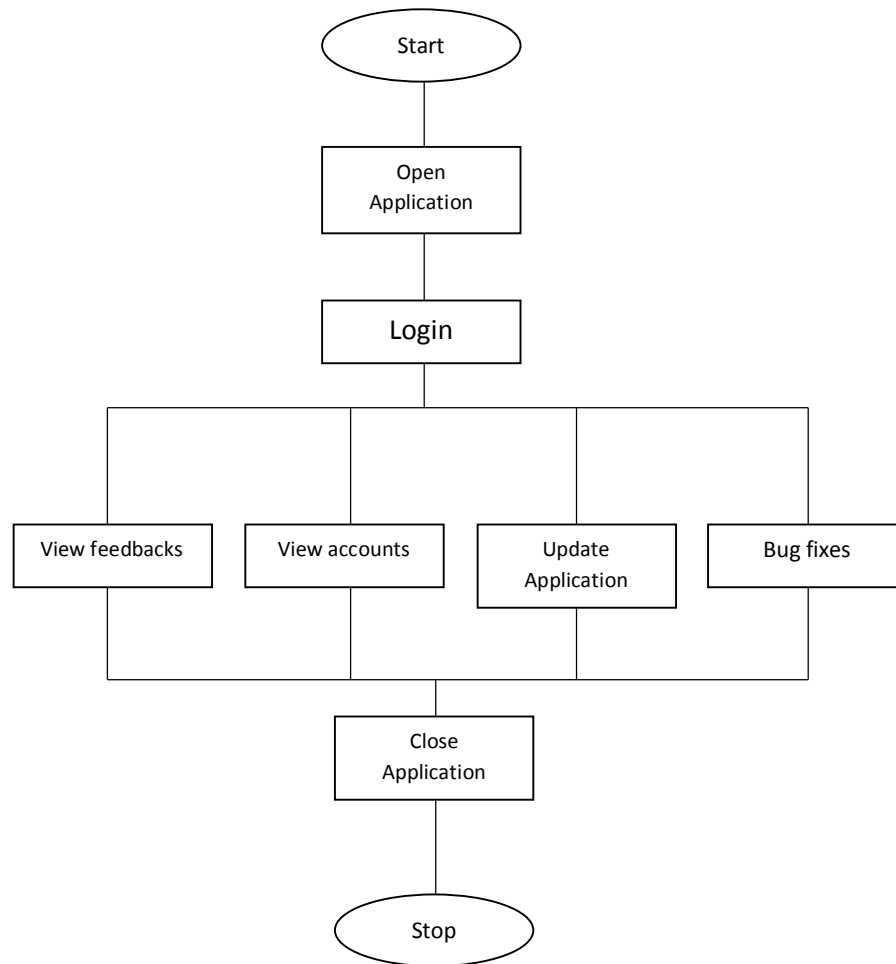


Figure 5: **Admin Program Workflow**

Figure 5 illustrates the workflow of the admin. It shows the sequence of activities that the admin can do in the system. The admin opens the application.

The admin will only view feedbacks of the users and view all the accounts that are registered in the application. Admin can also update the application and can also fix the bugs within the application.

Table 3
Validation Board

Start here brainstorming hypothesis. Pull to right start experiment.	Experiments	1	2	3
Who are your customers?	Customers	Operator	Passengers	Parents
What is the problem?	Problem	Advertising their services.	Having a difficult time commuting to and from school.	They do not have time to take their child to school.
Define your solution only after it's proven that the problem is worth solving.	Solution	A platform that can help them advertise their services.	A mobile application that can provide them with school transport service.	A mobile application that can provide them with school transport service for their children.
List all assumptions that must hold true for your hypothesis to be proven true	Riskiest Assumption	If operator chooses not to use the application.	Passengers do not meet the timetable for carpooling.	Does not trust other people to take their children.

Gantt Chart

Gantt Chart is one of the useful ways in illustrating a schedule that helps coordinate and track task in a project. A task shall have a name, corresponding task lead, the start date, and end date of the task.

Functional Decomposition Diagram

The functional decomposition diagram shows the breakdown of the different process into parts to fully understand the application. It illustrates how the different processes interact with each other.

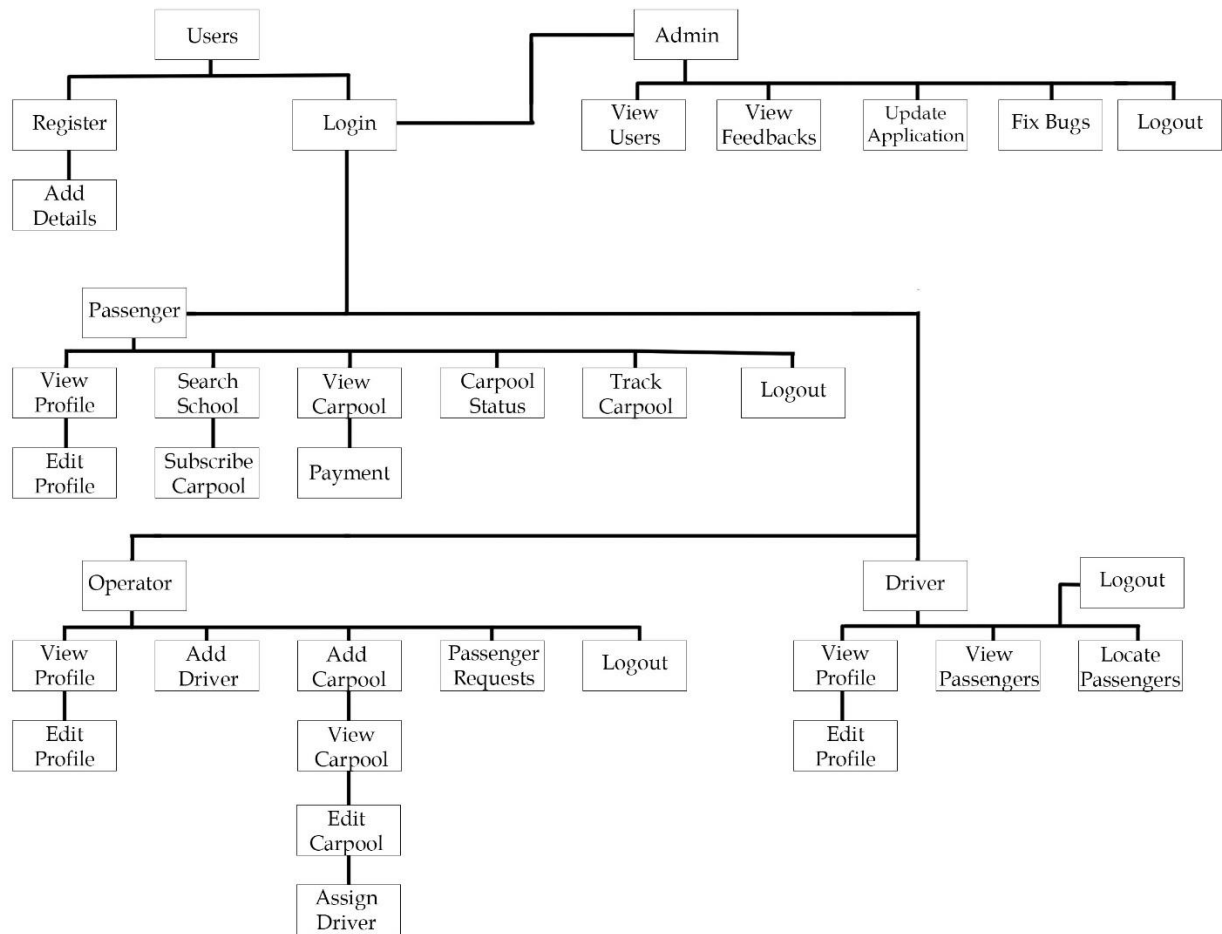


Figure 6: **Functional Decomposition Diagram**

Figure 6 shows the functional flow of the application that the passenger, operator, and the admin will be using. It starts from the application down to its different functions. It shows the functional breakdown of SchoolTranspo process which starts with either the registration or log-in. The system has three types of account.

The account for the passengers, operator and for the admin. Before the passenger or the operator can login, they must register by filling up the required fields. The passengers can message the driver to communicate for details or if they have some concerns.

The passengers will receive notification when the driver is nearby, when the vehicle arrives, when the passengers arrive at school and at home. The passengers can also report if there are somethings wrong with the app or with the driver. The passengers can browse the carpool driver list and choose a driver to subscribe, the passenger can also locate the carpool of their subscribed carpool.

The operator can add the details of their vehicle and its driver, so the passenger can identify their carpool service. The driver can report if there is something wrong with the app or issues the about the passenger. The operator will receive notification when there is a new passenger who requests to subscribe to their service. The driver can also send message to passenger if they have something to ask.

The admin will receive the reports sent by the passengers and drivers so they can take actions on the errors and issues.

Analysis-Design Phase

This section is composed of the use case diagram, user interface diagram, storyboard, database design, entity-relationship diagram, and the data dictionary of the system.

Use Case Diagram

This section shows the interaction between the user and the different functions of the application.

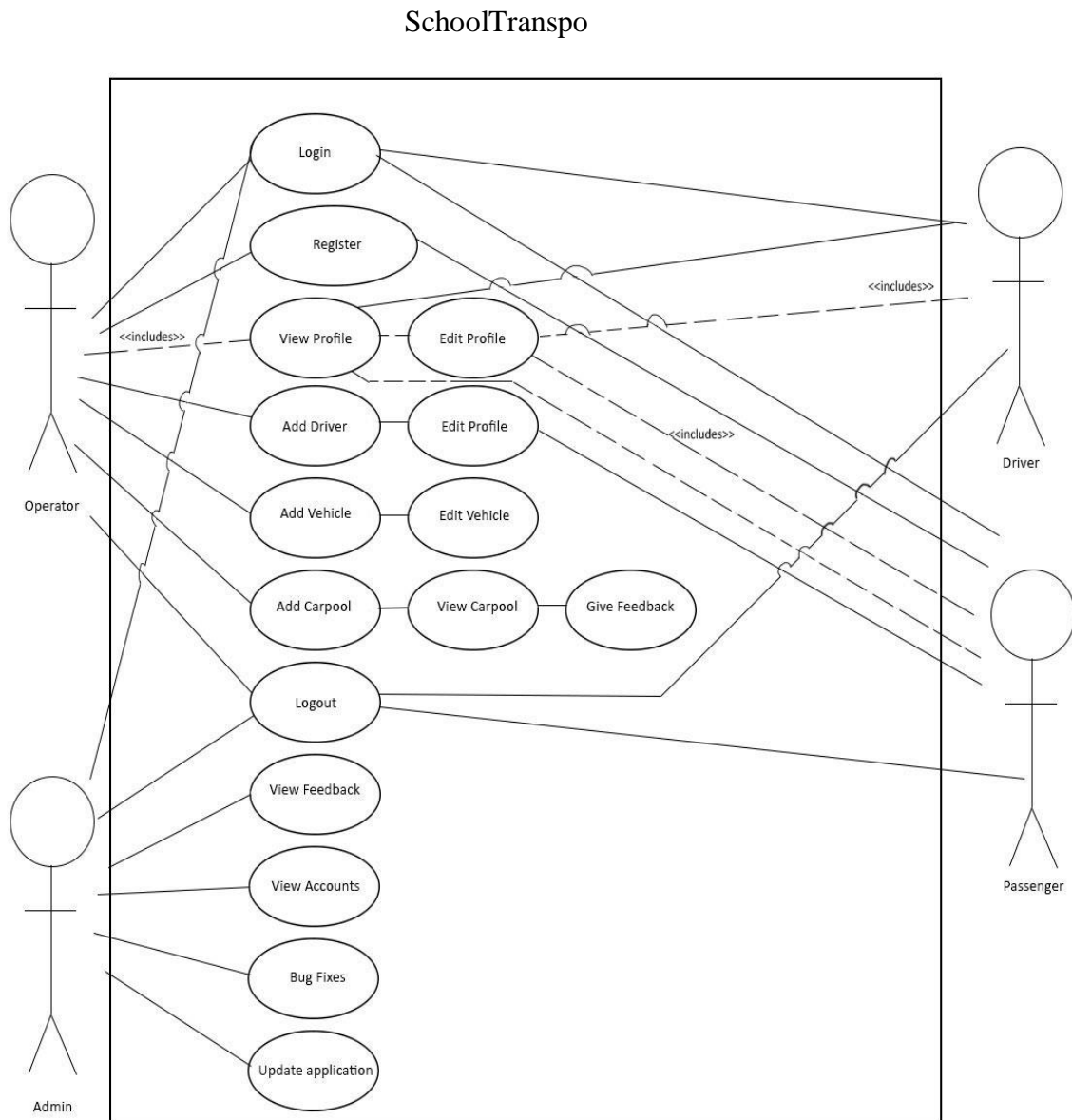


Figure 7: **Use Case Diagram**

Figure 7 shows the three users for the application, the passenger, driver, and admin. The passengers and drivers must register an account in order for them to login. They both can edit and view their profiles, add schools they go to, message each other and send feedback to the admins to report a bug or misbehaving users.

The passengers can add a carpool service and receive notification whenever the carpool vehicle is on its way to fetch, return, and when the passenger successfully dropped on the school premises.

The operator will have to add his/her vehicle in order to start his/her service for passengers to see and decide, the operator will also add a driver for the vehicle. The admins will take feedbacks from both passengers and drivers to do necessary fixing and analyzing.

User Interface Design

This section shows the expected visual layout where the user can interact with the application. The user interface is designed creatively to entertain and satisfy the user.



Figure 8: **Welcome Screen**

Figure 8 shows the welcome screen and logo to the users and redirects them to the next screen.

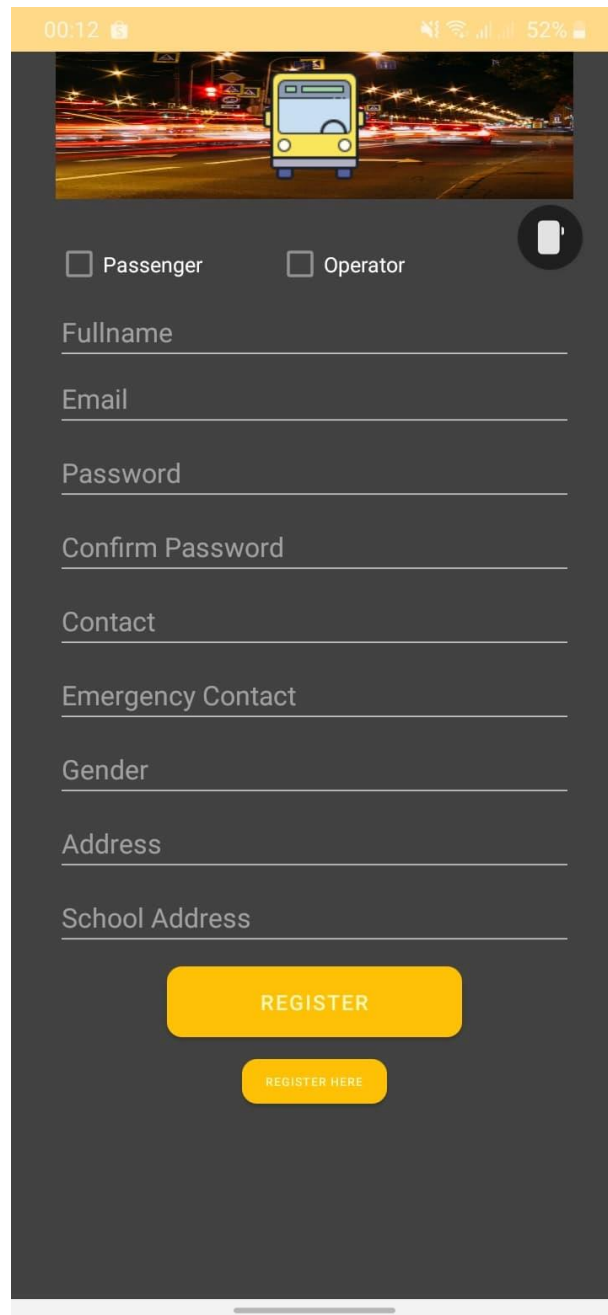
A screenshot of a mobile application's registration page. The screen has a dark grey background. At the top, there is a yellow header bar with the time '00:12' and various status icons (signal, Wi-Fi, battery at 52%). Below the header is a banner image showing a yellow bus in a city at night. Under the banner, there are two checkboxes: 'Passenger' and 'Operator'. To the right of these is a circular profile picture placeholder. Below the checkboxes are several text input fields: 'Fullname', 'Email', 'Password', 'Confirm Password', 'Contact', 'Emergency Contact', 'Gender', 'Address', and 'School Address'. At the bottom, there are two yellow buttons: a large 'REGISTER' button and a smaller 'REGISTER HERE' button below it.

Figure 9: **Registration**

Figure 9 shows the registration page where passengers and operators can partially complete their registration in order to have an account for the app. Passengers and operators are required to register to login.

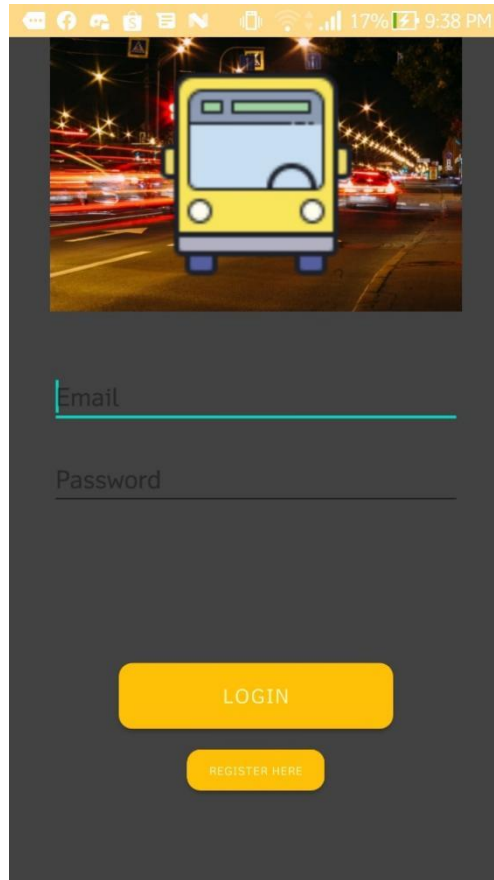


Figure 10: **Login**

Figure 10 shows the login page for all users and operators. This requires the user's/operator's login information in order to login, the unique username of the user/operator will be identified upon logging in.

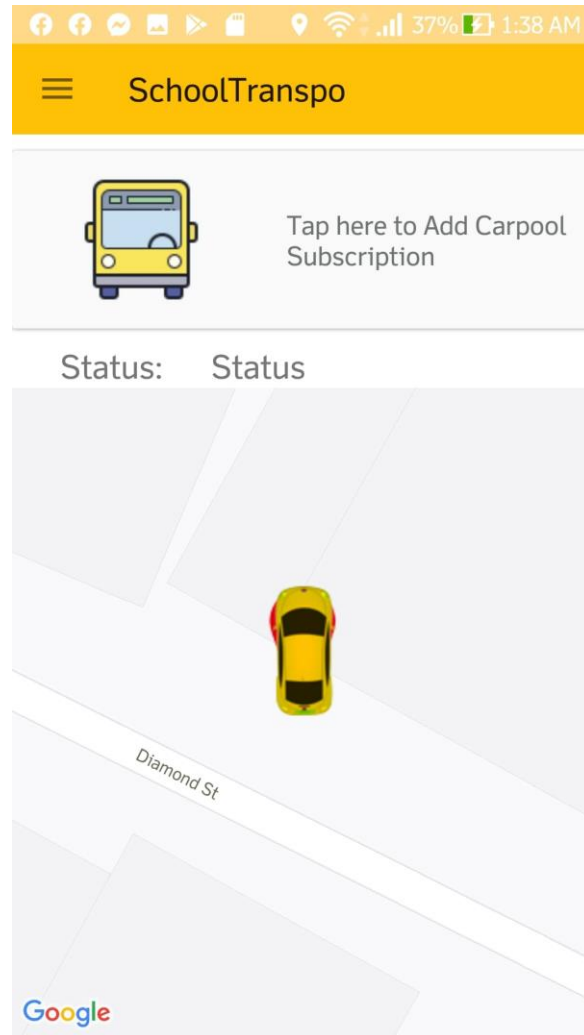


Figure 11: **Passenger Homepage**

Figure 11 shows the homepage of the passenger after logging in. this also has a map view and the driver's profile, and its status.



Figure 12: **Passenger Search Carpool**

Figure 12 shows the driver's details and their routes. Passengers can select which carpool they wish to request.

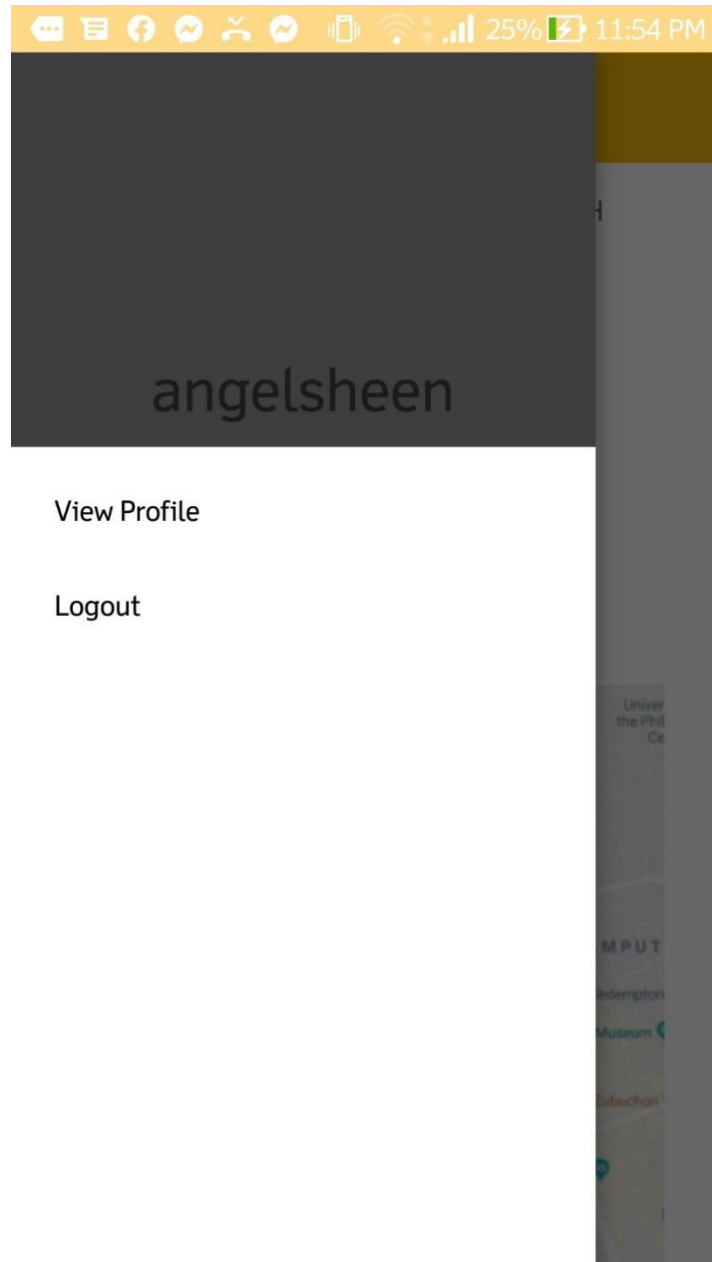


Figure 13: **Passenger Profile Navigation Drawer**

Figure 13 shows the profile of the passenger and a list of actions they can do. Passengers can also view their profile by tapping the view profile. And lastly, passengers can logout their accounts by tapping the logout. This navigation drawer will close when clicking outside the drawer.

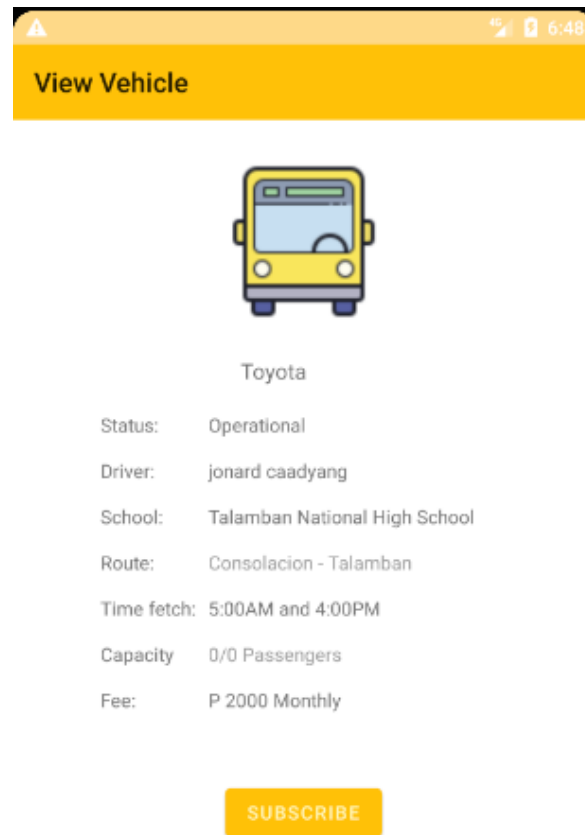


Figure 14: **Passenger Subscribe Carpool**

Figure 14 shows the carpool details from passenger's point of view and gives the passenger the option to subscribe.



Figure 15: **Passenger Subscribed Carpool**

Figure 15 shows the carpool details and gives the passenger the option to pay, unsubscribe or give feedback.

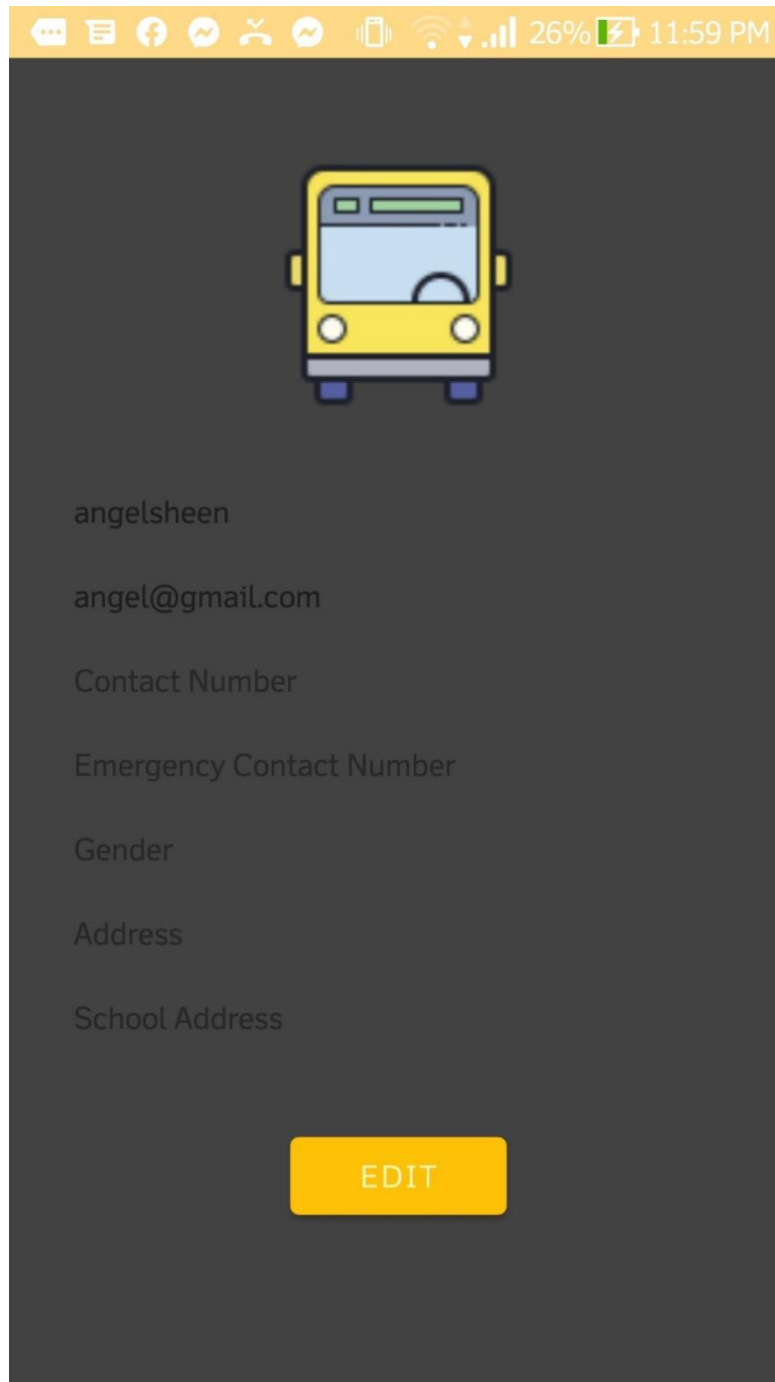
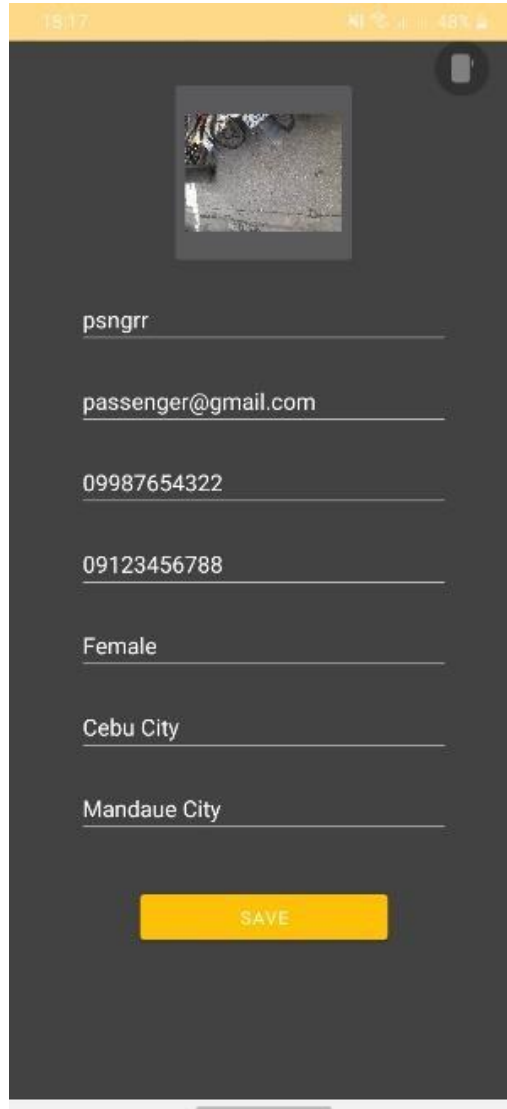


Figure 16: **User View Profile**

Figure 16 shows the user's profile. And they can choose to edit the changes in their profile.



18:17 48%

psngrr

passenger@gmail.com

09987654322

09123456788

Female

Cebu City

Mandaue City

SAVE

Figure 17: **User Edit Profile**

Figure 17 shows the fields where the user can input their updated information and upload a profile picture.

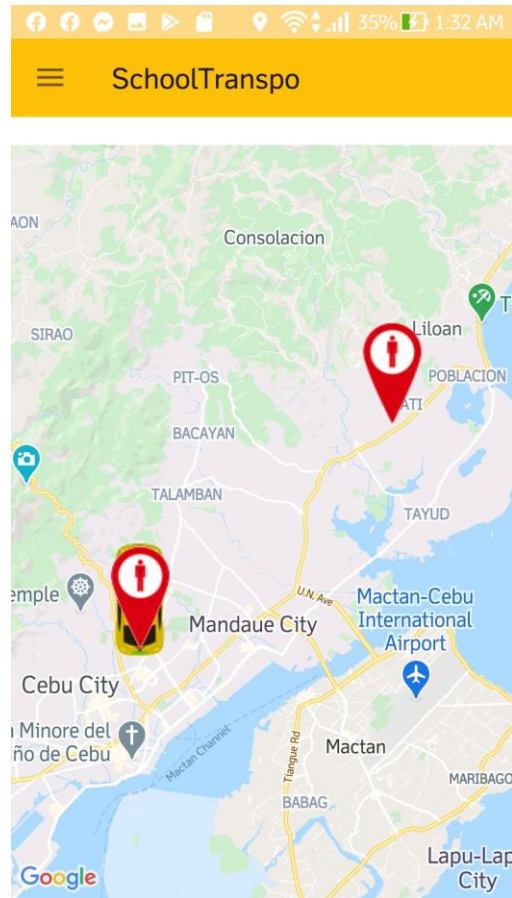


Figure 18: **Driver Homepage View**

Figure 18 shows the location of the passengers and status of the fetching status on the driver's interface.

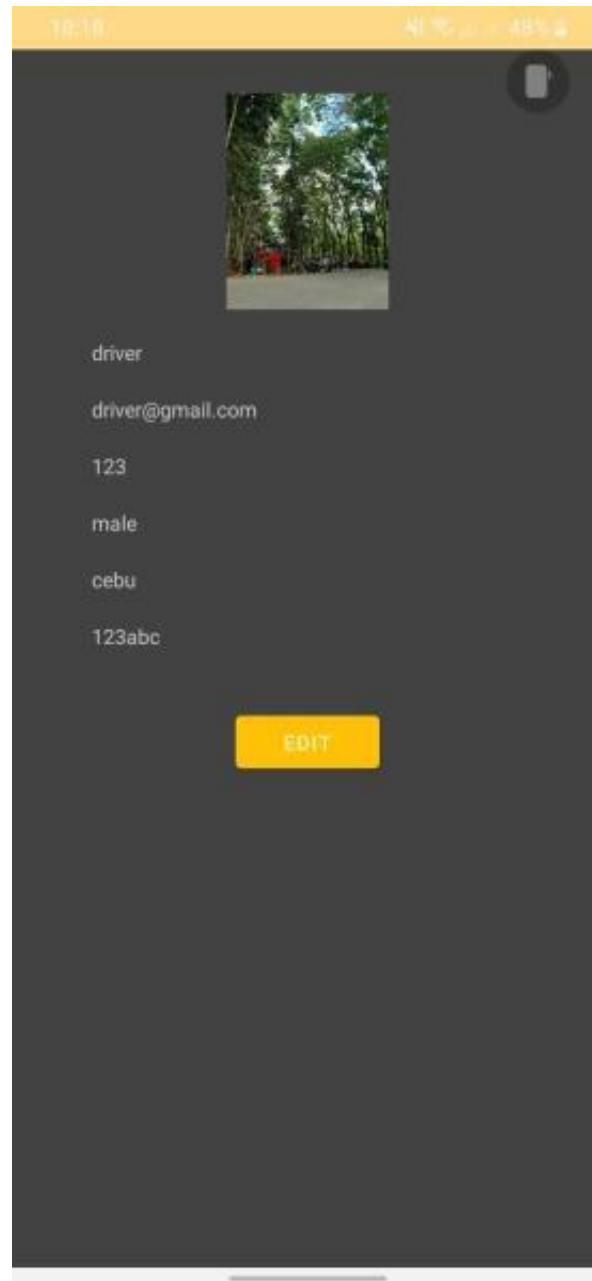


Figure 19: **Driver View Profile**

Figure 19 shows the driver's profile. And they can choose to edit the changes in their profile.

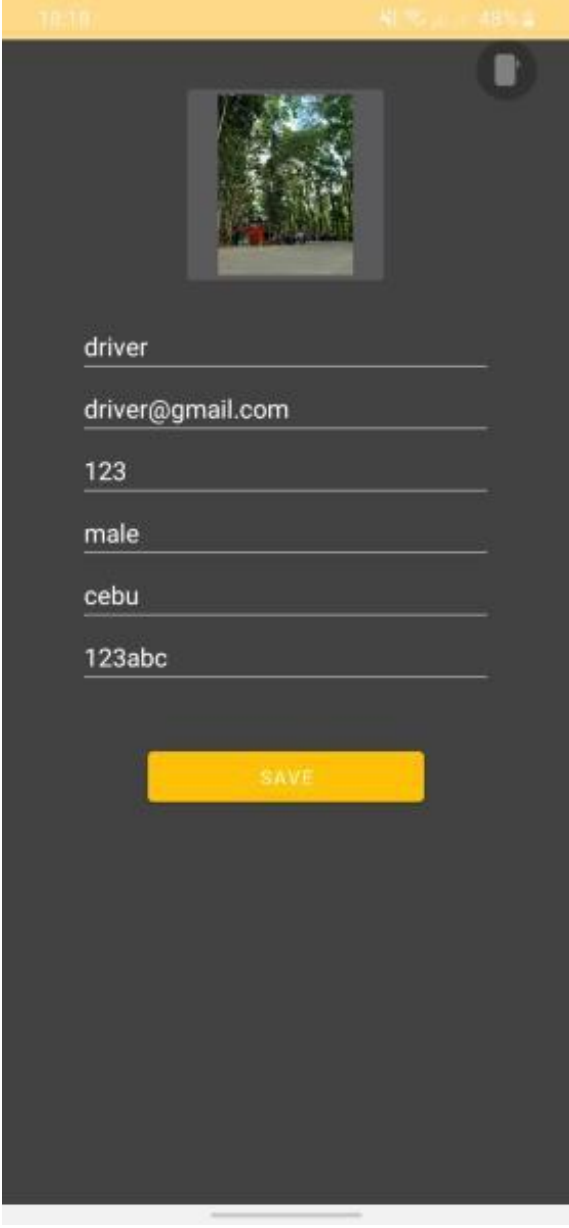
A mobile application interface for editing a driver's profile. At the top, a yellow status bar shows the time 10:10, signal strength, and battery level at 48%. Below this is a dark grey header bar with a white camera icon in the top right corner. The main content area is dark grey and contains a square profile picture placeholder showing a park scene. Below the picture are six text input fields with white text: 'driver', 'driver@gmail.com', '123', 'male', 'cebu', and '123abc'. At the bottom of the form is a yellow rectangular button with the word 'SAVE' in white capital letters.

Figure 20: **Driver Edit Profile**

Figure 20 shows the fields where the driver can input their updated information and upload a profile picture.

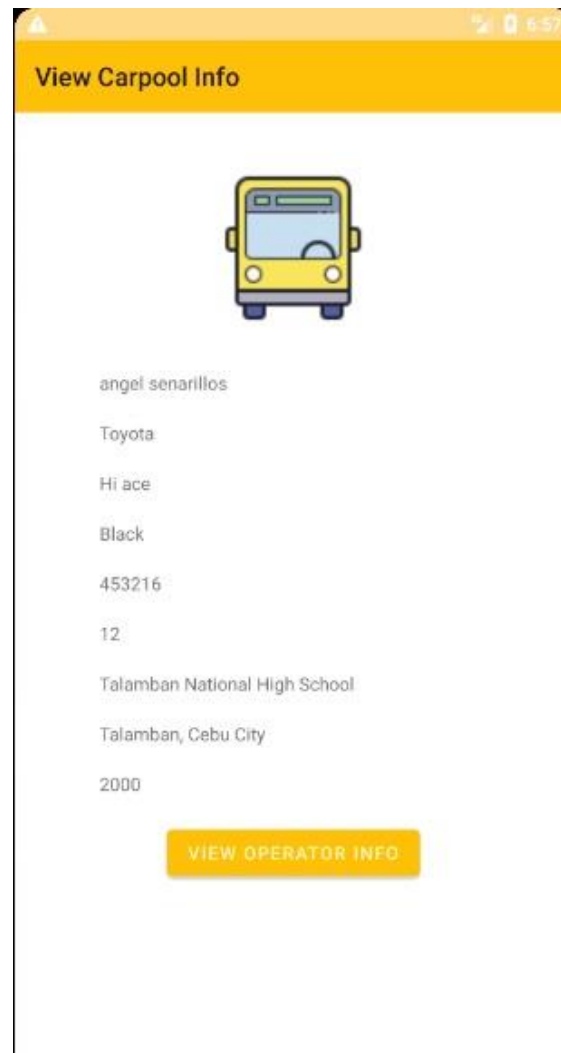


Figure 21: **Driver View Vehicle Details**

Figure 21 shows the driver's view vehicle details interface.

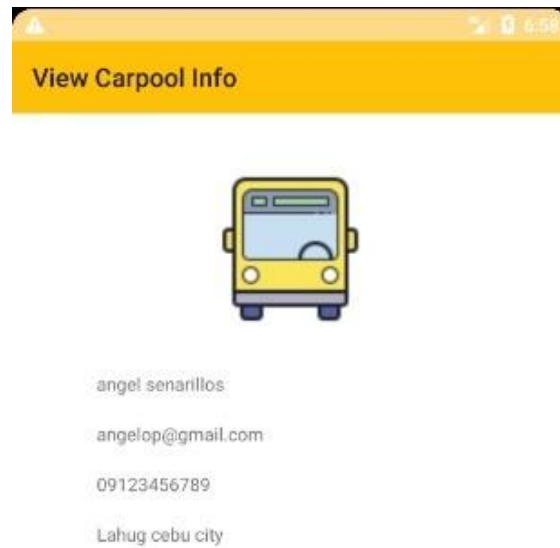


Figure 22: **Driver View Operator Info**

Figure 22 shows the driver's view operator details interface.



Figure 23: **Driver View Passenger List**

Figure 23 shows the driver's view passenger list interface.

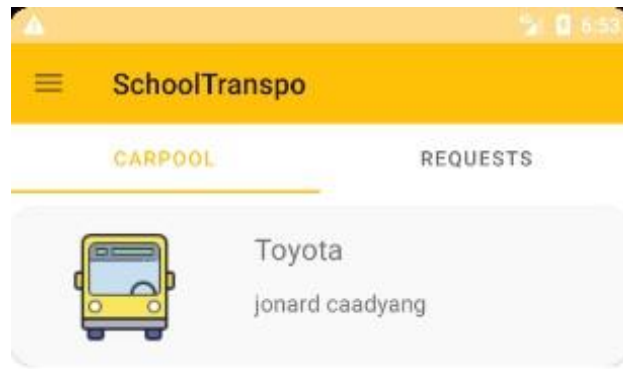


Figure 22: **Operator Homepage**

Figure 24 shows the lists of carpools that the operator owns.



Figure 25: **Operator Passenger Requests**

Figure 25 shows the passenger's pick-up requests towards the operator. The operator can accept or decline the passengers request.

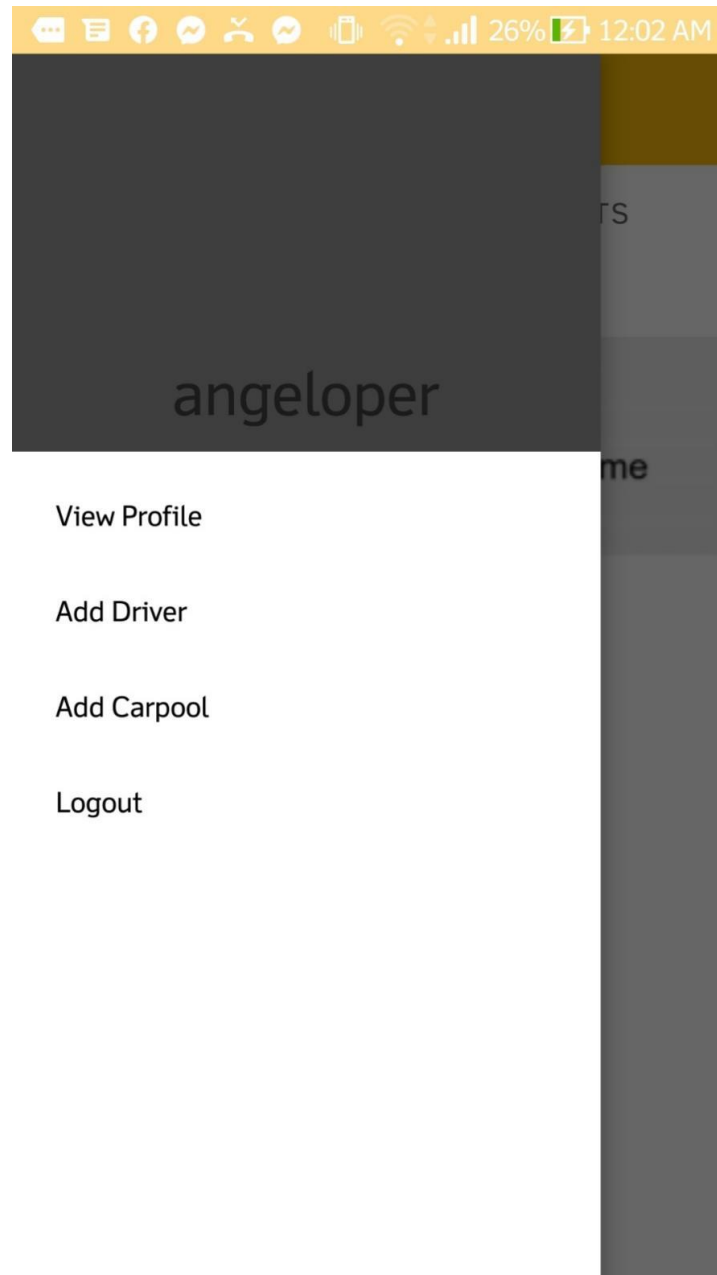


Figure 26: **Operator Profile Navigation Drawer**

Figure 26 shows the profile of the operator and a list of actions they can do. Operator can also view their profile by tapping the view profile. Operator can also add a driver on the by tapping add driver, and can also add carpool by also tapping the add carpool. And lastly, operator can logout their accounts by tapping the logout. This navigation drawer will close when clicking outside the drawer.

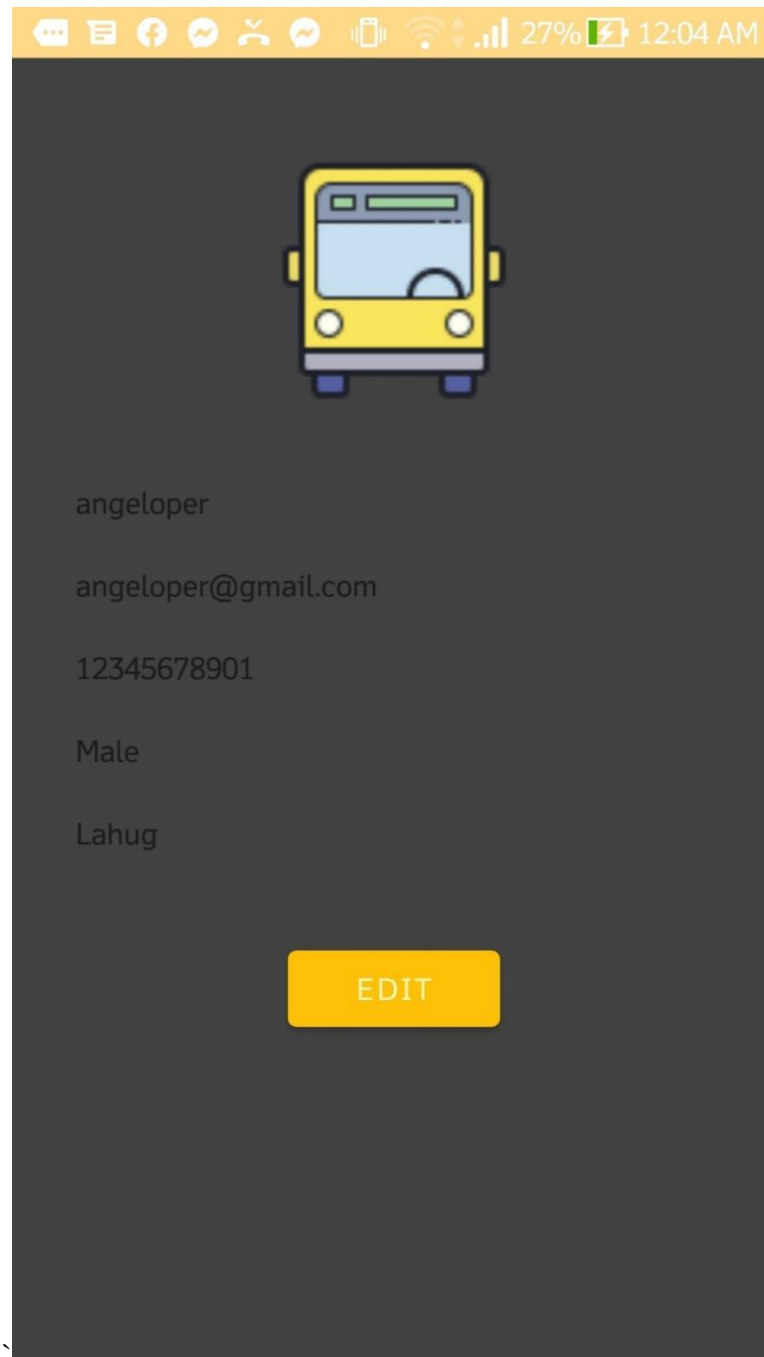
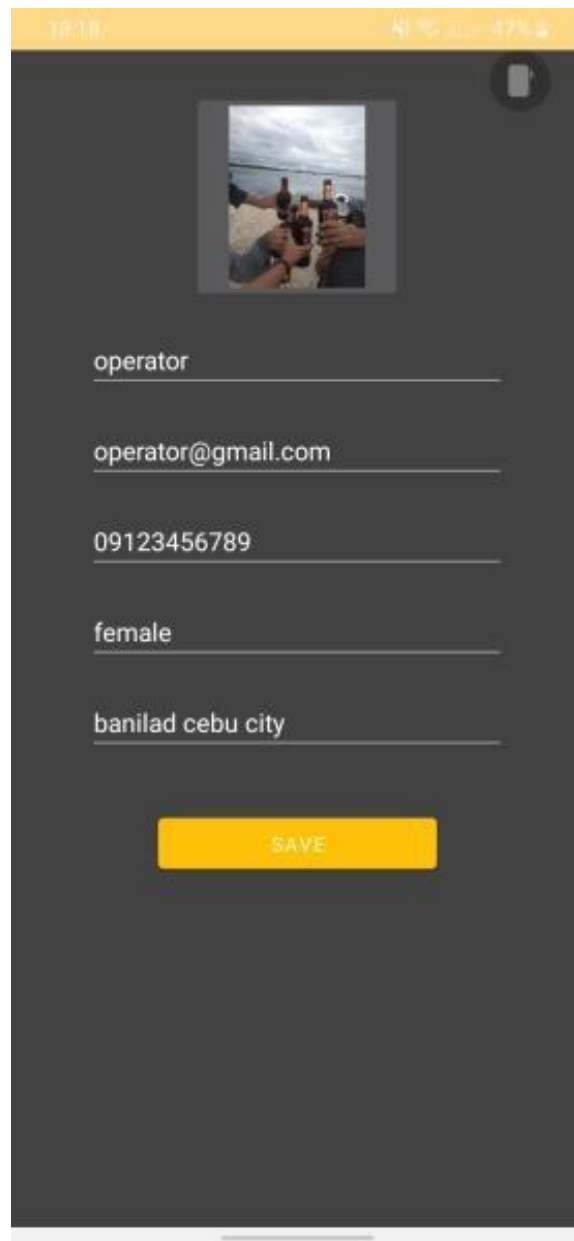


Figure 27: **Operator View Profile**

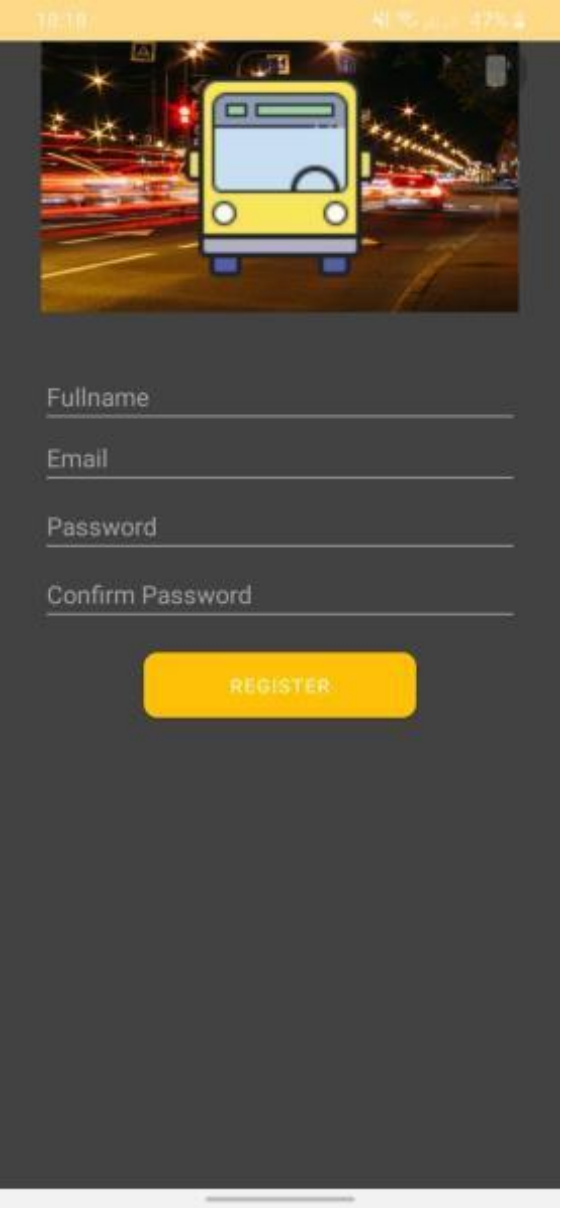
Figure 27 shows the profile for the operator. Operator can edit their profile from here if they wish to update their information by tapping the edit button.



The screenshot shows a mobile application interface for editing a profile. At the top, there is a yellow status bar with the time 10:10, signal strength, Wi-Fi, and battery level at 42%. Below the status bar is a dark gray header area containing a profile picture placeholder (a small square with a landscape image) and a circular icon with a plus sign for uploading a new picture. The main content area is dark gray and contains five text input fields with white text: 'operator', 'operator@gmail.com', '09123456789', 'female', and 'banilad cebu city'. Each field has a horizontal line underneath it. At the bottom of the form is a yellow rectangular button with the word 'SAVE' in white capital letters.

Figure 28: **Operator Edit Profile**

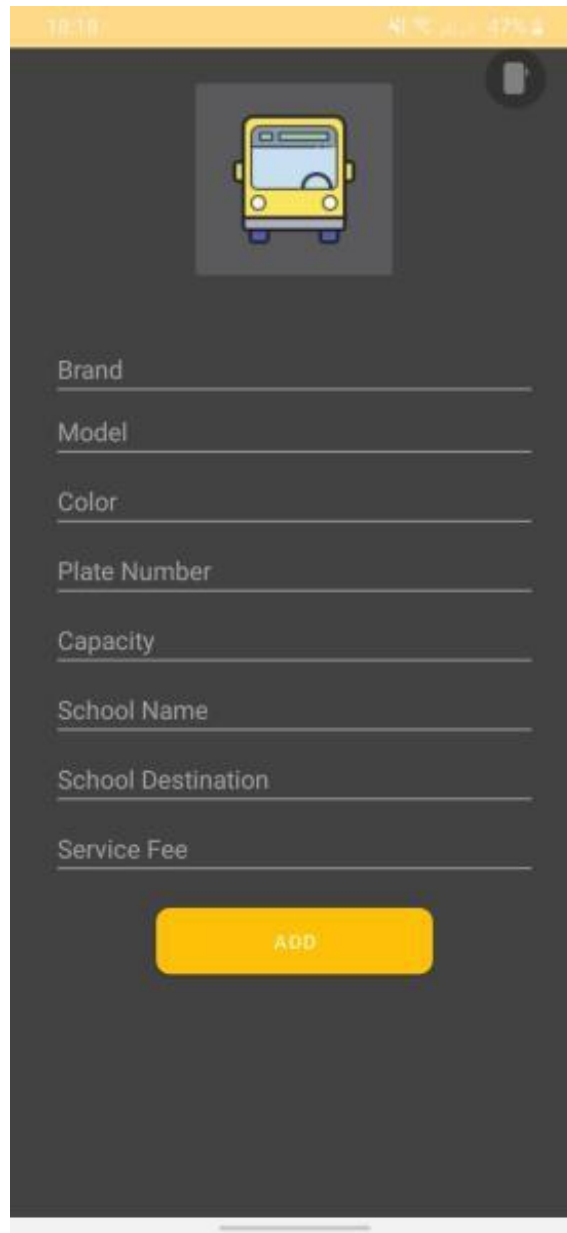
Figure 28 shows the fields where the user can input their updated information and upload a profile picture



The image shows a mobile application interface for registering a driver. At the top, there is a status bar with the time 18:18, signal strength, and battery level at 47%. Below the status bar is a header image featuring a yellow bus icon superimposed on a night city street scene with light trails. The main content area has a dark gray background and contains four text input fields labeled 'Fullname', 'Email', 'Password', and 'Confirm Password'. A prominent yellow 'REGISTER' button is positioned below the input fields. At the very bottom of the screen, a white horizontal line indicates the home indicator bar.

Figure 29: **Operator Add Driver**

Figure 29 shows how the operator will register their driver, by inputting their driver's details.



10:18 47%

Brand

Model

Color

Plate Number

Capacity

School Name

School Destination

Service Fee

ADD

Figure 30: **Operator Add Carpool**

Figure 30 shows how the operator will add their carpools, by inputting the carpool details.

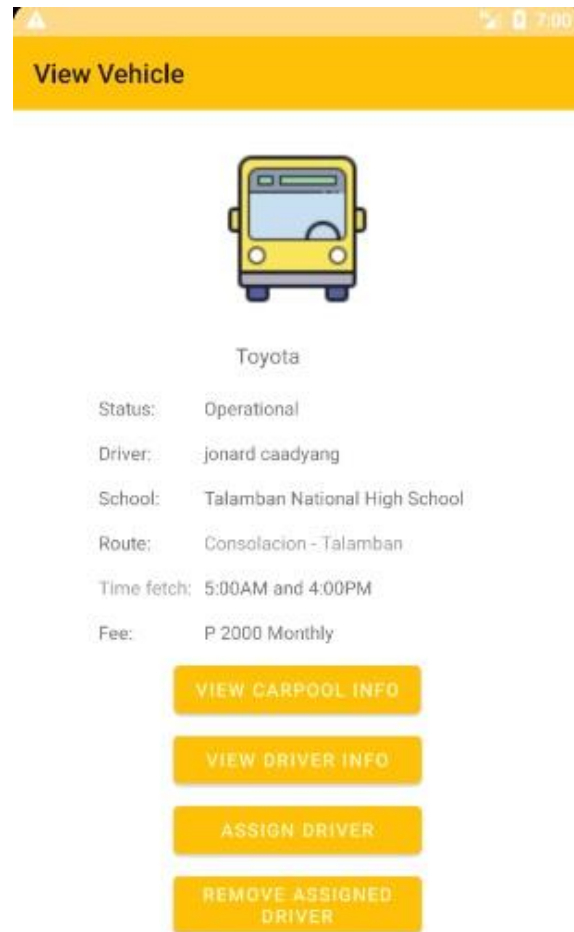


Figure 31: **Operator View Carpool Details**

Figure 31 shows the operator's interface in viewing the carpool details, operator can also assign drivers or removed assigned drivers on the carpool.

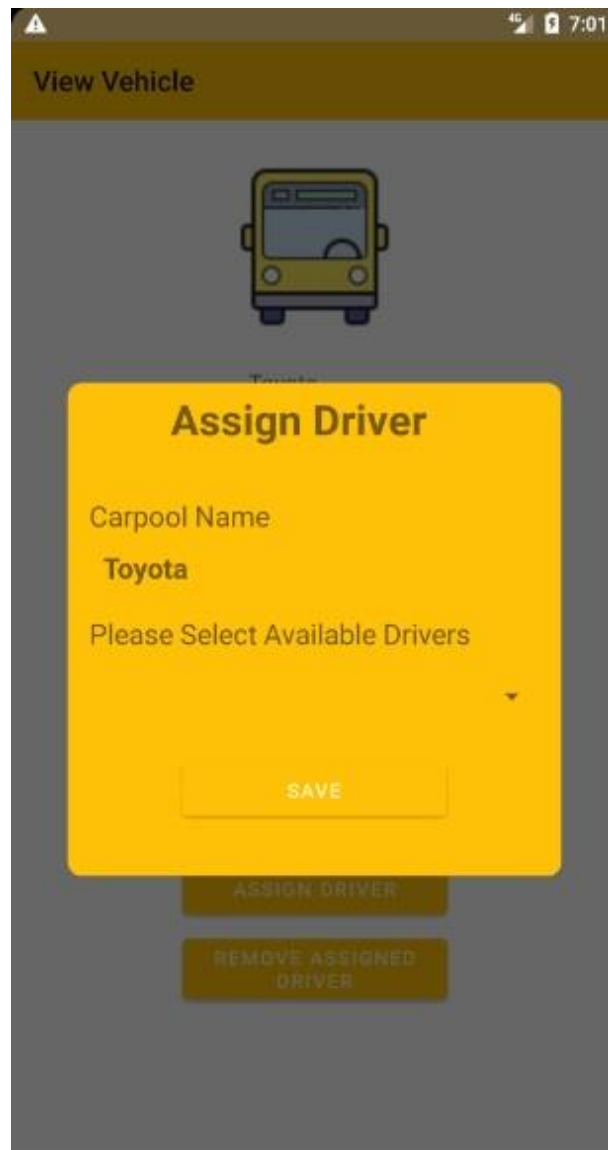
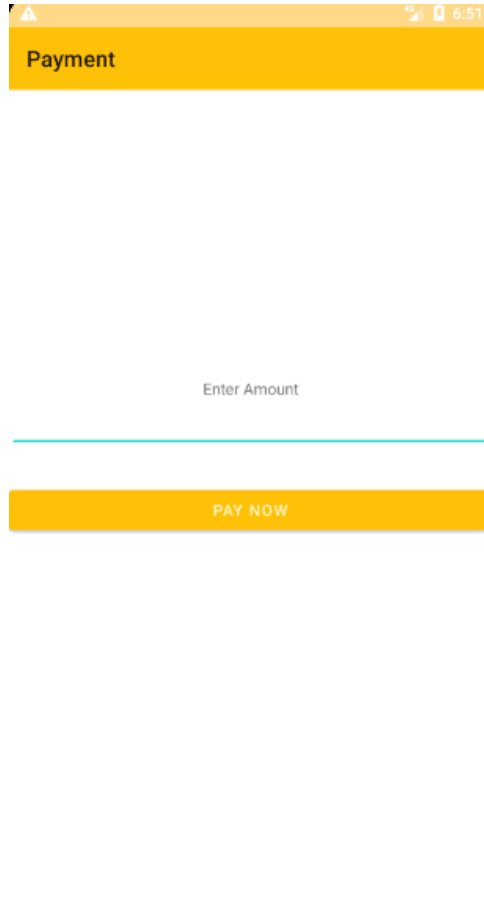


Figure 32: **Operator Assign Driver**

Figure 32 shows a pop out that allows operator to assign available drivers for the carpools.

A mobile application interface for a payment screen. At the top, there is a yellow header bar with the word "Payment" in black text. Below the header, the screen is white. In the center, there is a light gray rectangular input field with the placeholder text "Enter Amount". Below the input field is a yellow button with the text "PAY NOW" in black. At the bottom of the screen, there is a thin gray horizontal line.

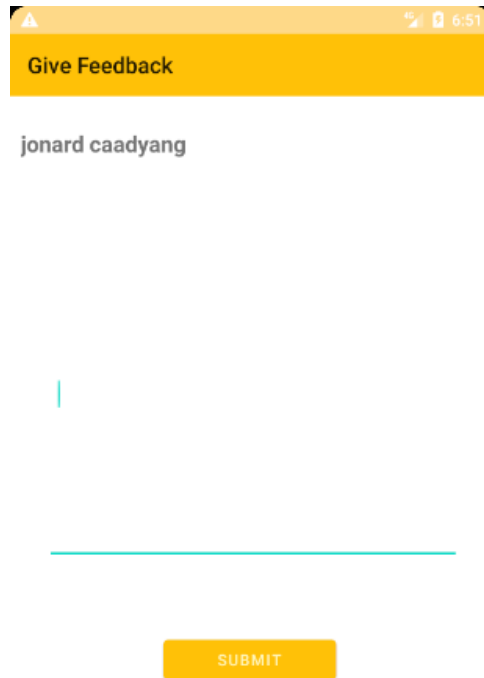
Payment

Enter Amount

PAY NOW

Figure 33: **User Payment Method**

Figure 33 shows the user's payment method.



A mobile application interface for providing feedback. At the top, there is a yellow header bar with the text "Give Feedback" in black. Below the header, the name "jonard caadyang" is displayed in a smaller, grey font. The main area of the screen is white and contains a large, empty text input field. A blue vertical cursor is visible on the left side of the input field, and a blue horizontal line is positioned below it. At the bottom center of the screen, there is a yellow rectangular button with the word "SUBMIT" in black capital letters.

Figure 34: **Feedback**

Figure 34 Shows the user's feedback of their experience of the app or service.



Figure 35: **Admin Homepage**

Figure 35 shows the admin's interface, from here admin can view the registered users and also the feedbacks.

Story Board

A storyboard is a graphic organizer in the form of illustrations or images displayed in sequence to fully understand the flow of the application.

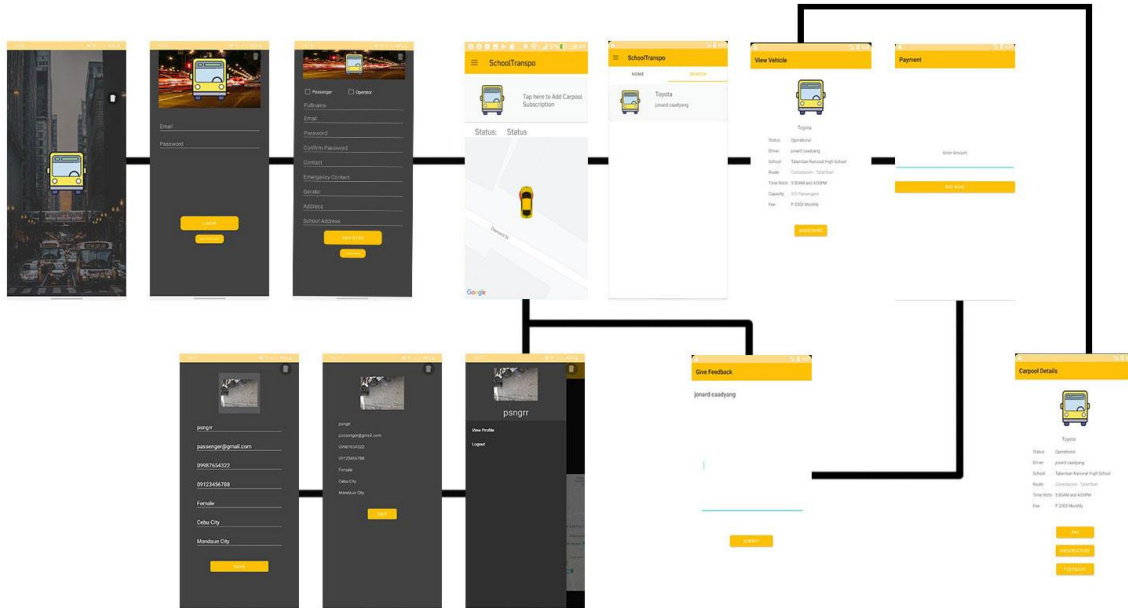


Figure 36: **User Storyboard**

Figure 36 shows the user's sequence in using the app. First the user will be welcomed and sent to the log in screen where if he/she haven't registered yet, then he/she will be redirected to the registration screen.

Once the user has successfully logged in, they will be able to see the home page where they see the carpool details and its live location on the map. If the user doesn't have a carpool yet, passenger will tap the search tab to view carpool drivers. The user then chooses a carpool service and subscribe and pay.

The homepage will also show the navigation drawer where the user can edit his/her profile, send feedback and log out.



Figure 37: **Operator Storyboard**

Figure 37 shows the operator's sequence in using the app. First the operator will be welcomed and sent to the log in screen where if he/she haven't registered yet, then he/she will be redirected to the registration screen.

Once the operator has successfully logged in, they will be able to see the home page where they see the carpool details, accept and decline passenger requests. The operator can also view the carpool details, they can also assign driver and remove assigned driver on their carpools.

This page also shows the navigation drawer where the operator can edit his/her profile, add drivers and vehicles and also log out.

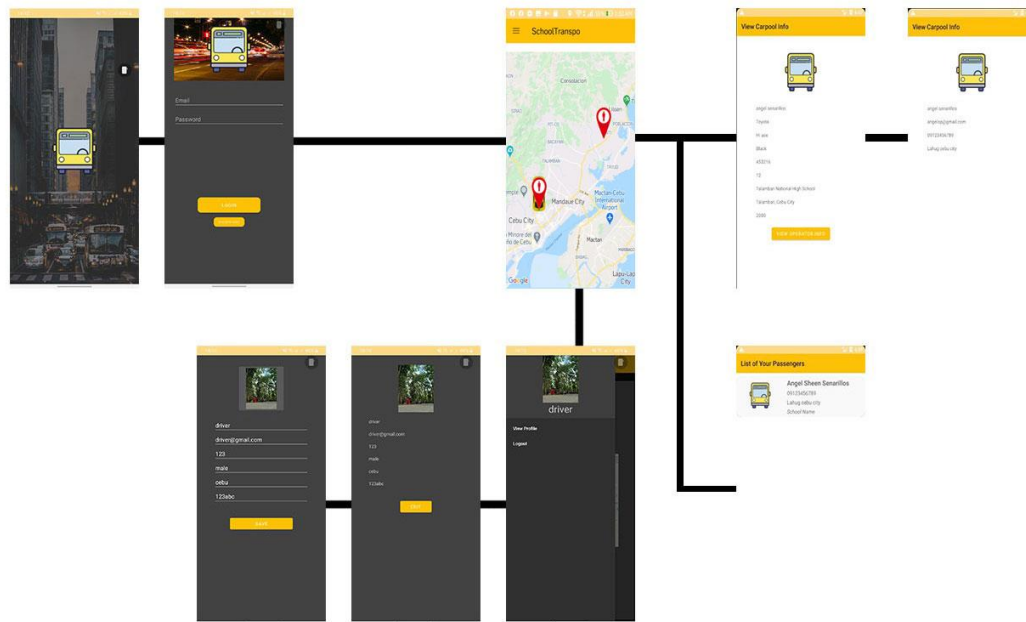


Figure 38: **Driver Storyboard**

Figure 38 shows the driver's sequence in the app. First the driver will be welcomed and sent to the log in screen. Only the operator can create a driver account for their drivers.

Once the driver has successfully logged in, they will be able to see the home page where they see the location of their passengers in the maps. Drivers can also view their passengers list and view their vehicle details and operator details.

Drivers are also able to view and edit their profile by tapping the navigation drawer on the side, and also choose to log out.

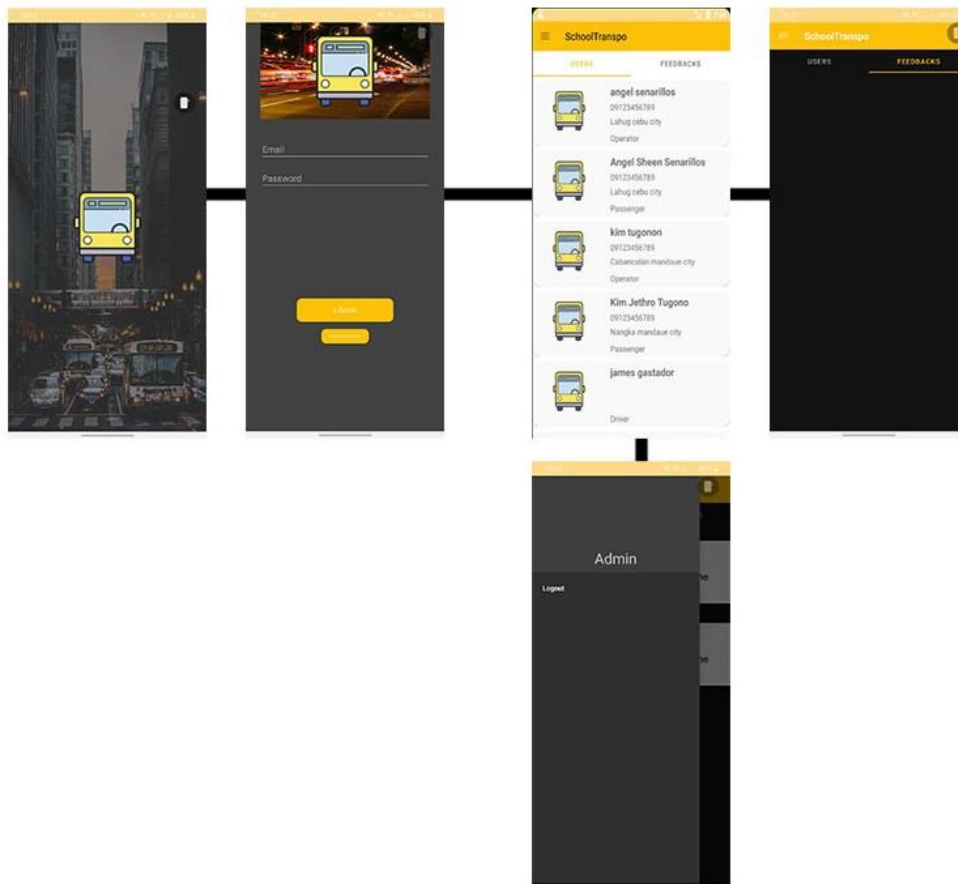


Figure 39: **Admin Storyboard**

Figure 39 shows the admin's sequence in the app. First the admin will be welcomed and sent to the log in screen. After the admin logs in to their account. The admin will be able to view all the registered accounts and also view all the feedbacks from the users.

Database Design

This section displays the different entities in our proposed system. The database Design shows how the tables or entities are related to each other and the relationship that exists between the entities or tables.

TABLE 5
USER FILE

USERDETAIL	
PK	USERID
	USERCONTACT
	USEREMAIL
	USERPASSWORD
	USERFULLNAME
	USEREMERGENCYCONTACT
	USERADDRESS
	USERGENDER
	USERLICENSE
	USERSCHOOLADDRESS
	USERPROFPIC
	USERTYPE

Table 5 shows the passenger details account which is composed of the user id, contact number, email, password, full name, emergency contact, address, gender, license, school address, profile picture, and user type.

TABLE 6

VEHICLE FILE

VEHICLEDETAIL	
PK	VEHICLEID
	VEHICLEBRAND
	VEHICLEPLATENO
	VEHICLEMODEL
	VEHICLESEATCAPACITY
	VEHICLECOLOR
FK	OPERATORID
	SCHOOLDESTINATION
	SCHOOLNAME
	SERVICEFEE
	STATUS

Table 6 shows the vehicle's details which are composed of vehicle ID, vehicle brand, vehicle plate number, vehicle model, vehicle capacity, vehicle color, operator's id, and vehicle status.

TABLE 7
CARPOOL FILE

CARPOOLDETAIL	
PK	CARPOOLID
	DRIVERNAME
FK	OPERATORID
FK	VEHICLEID
	VEHICLE

Table 7 shows the carpool's details which are composed of carpool ID, driver's name, operator's id, vehicle's id, and vehicle.

TABLE 8
SUBSCRIBER FILE

SUBSCRIBERDETAIL	
PK	SUBSCRIBERID
	DRIVERNAME
FK	OPERATORID
FK	PASSENGERID
	STATUS
FK	VEHICLEID
	VEHICLEBRAND

Table 8 shows the subscriber details which consists of subscriber's id, driver's name, operator's id, passenger's id, status, vehicle id and the vehicle brand.

TABLE 9
ADMIN FILE

ADMINDETAIL	
PK	ADMINID
	ADMINUSERNAME
	ADMINPASSWORD

Table 9 shows the admin's details which consists of admin's id, admins' username, and admin's password.

TABLE 10
FEEDBACK FILE

FEEDBACKDETAIL	
PK	FEEDBACKID
FK	FEEDBACKUSERID
	FEEDBACKCONTENT

Table 10 shows the feedback details which consists of feedback id, feedback user's id, and feedback content.

Entity Relationship Diagram

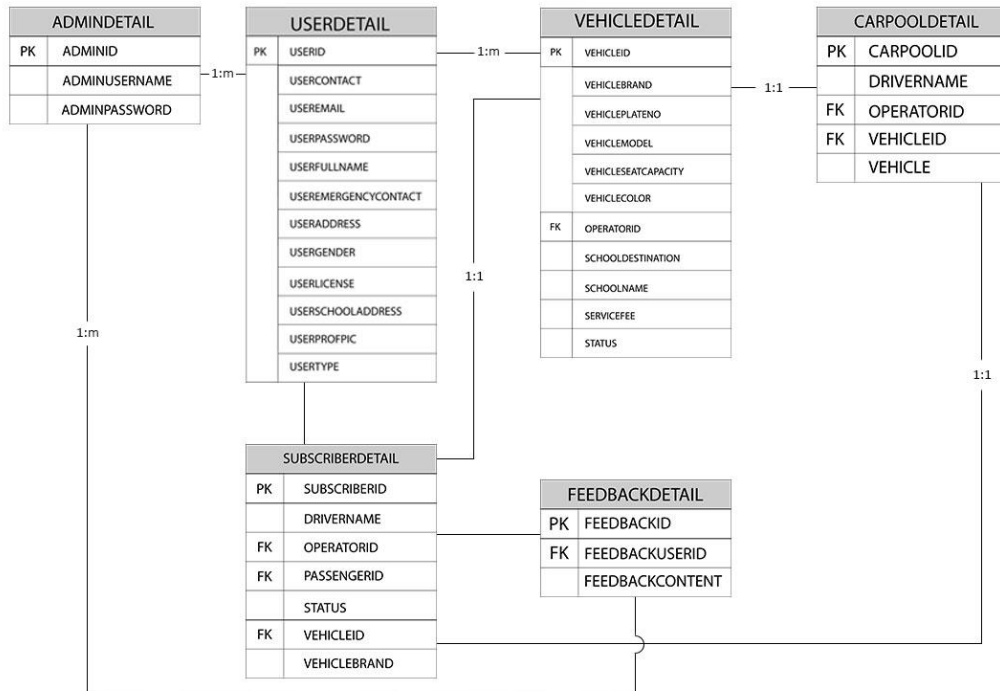


Figure 33: **Entity Relationship Diagram**

Figure 33 shows the relationship between the tables in the database. The figure illustrates the cardinality of each end of the relationships. Each table has its foreign key and primary key to be able to connect with the other table.

Data Dictionary

This section describes the data types, properties, and size of the fields in the tables shown in the database design.

Table 11

USER DETAIL FILE

Table Name	Column Name	Data Type	Field Size	Null	Description
USERDETAILFILE	USERID	Int	50	Not null	User's unique id number
	USERCONTACT	Int	11	Not null	User's contact number
	USEREMAIL	Varchar	30	Not null	User's email
	USERPASSWORD	Varchar	30	Not null	User's password
	USERFULLNAME	Text	50	Not null	User's full name
	USEREMERGENCYCONTACT	Int	11	Not null	User's emergency contact number
	USERADDRESS	Text	40	Not null	User's address
	USERGENDER	Text	15	Not null	User's gender
	USERLICENSE	Text	15	Not null	User's license number
	USERSCHOOLADDRESS	Text	30	Not null	User's school address

Table 11.1
USER DETAIL FILE cont'd

	USERPROFPIC	Varchar	30	Not null	User's profile picture
	USERTYPE	Text	10	Not null	User's account type

Table 11 presents the fields of the user detail file. This holds the necessary information of the user. This will be the basis if the user had created an account. The primary key is the USERID.

Table 12
VEHICLE DETAIL FILE

Table Name	Column Name	Data Type	Field Size	Null	Description
VEHICLESDETAIL	VEHICLEID	Int	50	Not null	Vehicle's unique id code
	VEHICLEBRAND	Text	20	Not null	Vehicle's brand
	VEHICLEPLATENO	Varchar	30	Not null	Vehicle's plate number
	VEHICLEMODEL	Text	20	Not null	Vehicle's model
	VEHICLECOLOR	Text	20	Not null	Vehicle's color
	VEHICLESEATCAPACITY	Int	10	Not null	Vehicle's seat capacity
	OPERATORID	Int	20	Not null	Operator's id
	SCHOOLDESTINATION	Text	50	Not Null	Vehicle's school destination

Table 12.1
VEHICLE DETAIL FILE cont'd

SCHOOLNAME	Text	20	Not Null	Vehicle's school name.
SERVICEFEE	Int	10	Not Null	Vehicle's service fee.
VEHICLESTATUS	Text	15	Not null	Vehicle's status

Table 12 presents the fields of the vehicle file. This holds the necessary information of the vehicle. This will be the basis if the user had created an account. The primary key is the VEHICLEID.

Table 13
SUBSCRIBER DETAIL FILE

Table Name	Column Name	Data Type	Field Size	Null	Description
SUBSCRIBERDETAIL	SUBSCRIBERID	Text	50	Not Null	Subscriber's unique ID code.
	DRIVERNAME	Text	50	Not Null	Subscribed carpool assigned driver's full name.
	OPERATORID	Text	50	Not Null	Subscribed carpool assigned operator's ID.
	PASSENGERID	Text	50	Not Null	Subscribing passenger's ID.
	STATUS	Text	15	Not Null	Subscribed carpool status.
	VEHICLEID	Text	50	Not Null	Subscribed carpool assigned vehicle's ID.
	VEHICLEBRAND	String	15	Not Null	Subscribed carpool's vehicle brand.

Table 13 presents the fields of the subscriber file. This holds the necessary information of the subscribers. The primary key is the SUBSCRIBERID.

Table 14

ADMIN DETAIL FILE

Table Name	Column Name	Data Type	Field Size	Null	Description
ADMINDETAIL	ADMINID	Int	20	Not null	Admin's unique id number
	ADMINUSERNAME	Varchar	20	Not null	Admin's username
	ADMINPASSWORD	Varchar	20	Not null	Admin's password

Table 14 shows and holds the information of the admin detail file. This is the admin's account. The primary key is the ADMINID.

Table 15

FEEDBACK DETAIL FILE

Table Name	Column Name	Data Type	Field Size	Null	Description
FEEDBACKDETAIL	FEEDBACKID	Int	20	Not null	feedback unique id number
	FEEDBACKUSERID	Int	20	Not null	feedback user's id
	FEEDBACKCONTENT	Varchar	200	Not null	feedback content

Table 15 shows and holds the information of the feedback file. The primary key is the FEEDBACKID.

Network Design

This section explains how the data is being processed and transferred from one media to another.

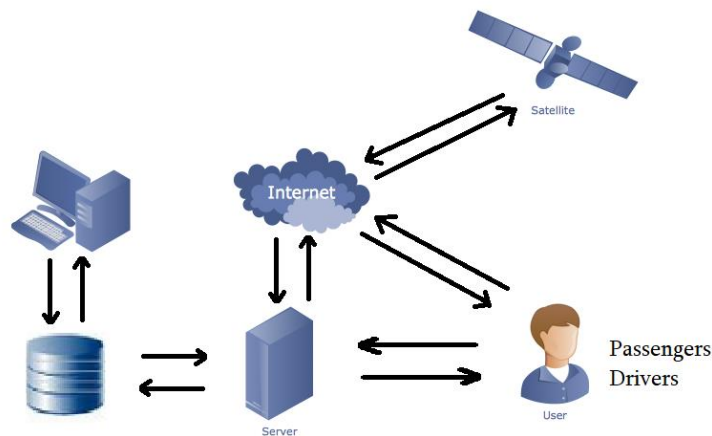


Figure 40: **Network Topology**

Figure 40 represents the network topology of the project SchoolTranspo. The programmer will make the database which is connected to the server, where the server connected to the internet in order for the application in the user's phones and tablets can communicate to the server and to the database. And by connecting to the internet, the phone can access the Global Positioning System.

Technology Stack Diagram

Technology Stack Diagram illustrates the current state of the application. The components stated below are the steps in making our application. The proposed system

contains different types of technologies that will be used in developing the mobile application, the server-side of the application, or for future development.

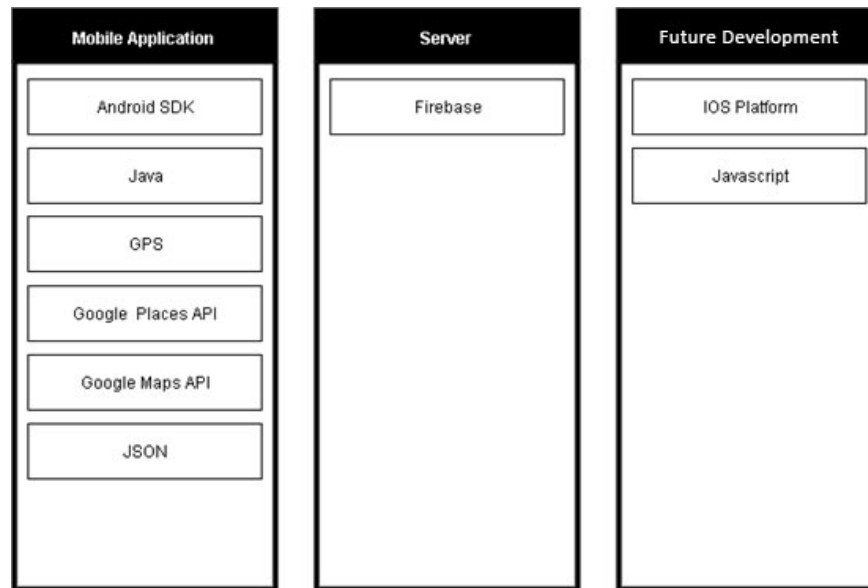


Figure 41: **Technology Stack Diagram**

Figure 41 shows the technology stack for the application SchoolTranspo. This presents the technologies that are being used for the applied and practiced development and improvements of the application. Advance programming and scripting languages are required for making a competent software.

For the mobile development, programming languages and tool-kits are being used in order to develop the software, such as Android SDK. Android SDK is a Software Development Kit for an android studio that enables the developers to create astounding applications in the Android mobile operating system. Google Map API is used to access the map of the world. The built-in Global Positioning System in common smartphones nowadays will provide coordinates in the map.

For the future Web Development, different scripting languages are used. JavaScript for frontend interaction with the user, An IOS Platform will also be provided for future platform ventures.

The Firebase is used for real-time database queries for more interactive software design, and for faster and more accessible data retrieving.

Program Specification

The program specification lists the functionalities of the system broken down into modules. Each module is further divided into the list of algorithms and assigned to a programmer. It also shows every team member's assignment on what module to work on. Through the program specification, what the system is expected to do is made clear and this serves as an input to the implementation phase of the proposed system.

Table 16
LIST OF MODULES

Programmers	Modules	Users
James Vincent Gastador	Registration	
	1. Register Carpool Driver	Carpool Driver
	2. Register Passenger	Passenger
No. of Points (<i>1 per module per user</i>)		
James Vincent Gastador	Log in	
	1. Log in Carpool Driver	Carpool Driver
	2. Log in Passenger	Passenger
	3. Log in Admin	Admin
No. of Points (<i>1 per module per user</i>)		
Angel Sheen Senarillos	Profile Manager	
	1. View Carpool Driver Profile	Carpool Driver, Passenger
	2. View Carpool Passenger	Carpool Driver, Passenger
	3. Edit Carpool Driver Profile	Carpool Driver
	4. Edit Carpool Passenger	Passenger
No. of Points (<i>1 per module per user</i>)		
Angel Sheen Senarillos	Carpool	
	1. Add Carpool	Passenger
	2. Edit Carpool	Carpool Driver
	3. View Carpool	Passenger
	4. Rate Carpool	Passenger
No. of Points (<i>1 per module per user</i>)		
James Vincent Gastador	Vehicle	
	1. Add Vehicle	Carpool Driver
	2. Edit Vehicle	Carpool Driver
	3. View Vehicle	Carpool Driver, Passenger
No. of Points (<i>1 per module per user</i>)		
Kim Jethro Tugonon	School	
	1. Add School	Carpool Driver, Passenger
	2. Edit School	Carpool Driver
No. of Points (<i>1 per module per user</i>)		
Angel Sheen Senarillos	History	
	1. View History	Carpool Driver, Passenger, Admin
No. of Points (<i>1 per module per user</i>)		

Table 16.1
LIST OF MODULES cont'd

Kim Jethro Tugonon	Transaction	
	1. Create Transaction	Passenger
	2. Accept Transaction	Carpool Driver
	3. View Transaction Details	Carpool Driver, Passenger
No. of Points (<i>1 per module per user</i>)		
Angel Sheen Senarillos	Search	
	1. Search School	Carpool Driver, Passenger
	2. Search Carpool	Passenger
	No. of Points (<i>1 per module per user</i>)	
Jonard Caadyang	Rating	
	1. Rate Carpool	Passenger
No. of Points (<i>1 per module per user</i>)		
Angel Sheen Senarillos	Message	
	1. Message Carpool Driver	Passenger
	2. Message Passenger	Carpool Driver
	No. of Points (<i>1 per module per user</i>)	
Kim Jethro Tugonon	Report	
	1. Report item	Carpool Driver, Passenger
	2. View Report	Admin
	No. of Points (<i>1 per module per user</i>)	
Kim Jethro Tugonon	Tracking	
	1. Track all user's transaction	Admin
No. of Points (<i>1 per module per user</i>)		
Number of Modules per User (<i>equals total no. of points per user</i>)		Carpool Driver: 11 Passenger: 12 Admin: 4
Total Number of Modules		13

Table 16 shows the different modules and the assigned persons for the development of a certain module. The program specification is the definition of what the system is expected to do.

Testing/Quality Assurance Phase

This section shows the numerous test levels used by the proponents to test SchoolTranspo. It consists the unit testing, integration testing, alpha testing and acceptance testing.

Unit Testing

Unit testing is a level of software testing in which particular software units/components are evaluated. It is also called part testing, where in each module the testing is performed. The aim is to validate that the program performs as designed by each device.

Table 17

UNIT TESTING – USER

Module Name	Unit Name	Date Tested	Test Case ID	Test Case Description	Expected Result	Actual Result	Remarks
Register	Sign Up	01/05/21	U1	All fields are filled and valid	Proceed to next step	Performed expected output	Passed
Register	Sign Up	01/05/21	U2	All fields are filled but invalid	Prompt a message that input is invalid	Performed expected output	Passed
Register	Sign Up	01/05/21	U3	All fields are not filled and invalid	Prompt a message to fill all fields	Performed expected output	Passed
Register	Sign Up	01/05/21	U4	Tap Login button to go to login activity	Goes to login activity	Performed expected output	Passed
Login	Login	01/05/21	U5	Tap Sign up button to go to register activity	Goes to register activity	Performed expected output	Passed
Login	Login	01/05/21	U6	All fields are filled and valid	Proceed to next step	Performed expected output	Passed
Login	Login	01/05/21	U7	All fields are filled but invalid	Prompt message that input is invalid	Performed expected output	Passed
Login	Login	01/05/21	U8	All fields are not filled and invalid	Prompt message to fill all fields	Performed expected output	Passed
Logout	Logout	01/05/21	U9	Tap logout button	Successfully logs out user	Performed expected output	Passed

Table 17.1
UNIT TESTING – USER cont'd

View Profile	View Profile	01/05/21	U10	Tap view profile	Displays user profile	Performed expected output	Passed
View Profile	Edit Profile	01/05/21	U11	Tap edit button on profile activity	Allows user to input profile fields	Performed expected output	Passed
Homepage	Homepage	01/05/21	U12	Tap navigation menu	Displays navigation drawer	Performed expected output	Passed
Homepage	Homepage	01/05/21	U13	Tap search tab	Displays a list of carpools that can be browsed	Performed expected output	Passed
Search	Search Carpools	03/17/21	U14	Browse carpools	Searches the carpool inputted in the search field	Performed expected output	Passed

Table 18
UNIT TESTING – OPERATOR

Module Name	Unit Name	Date Tested	Test Case ID	Test Case Description	Expected Result	Actual Result	Remarks
Register	Sign Up	01/05/21	OP1	All fields are filled and valid	Proceed to next step	Performed expected output	Passed
Register	Sign Up	01/05/21	OP2	All fields are filled but invalid	Prompt a message that input is invalid	Performed expected output	Passed
Register	Sign Up	01/05/21	OP3	All fields are not filled and invalid	Prompt a message to fill all fields	Performed expected output	Passed
Register	Sign Up	01/05/21	OP4	Tap Login button to go to login activity	Goes to login activity	Performed expected output	Passed
Login	Login	01/05/21	OP5	Tap Sign up button to go to register activity	Goes to register activity	Performed expected output	Passed
Login	Login	01/05/21	OP6	All fields are filled and valid	Proceed to next step	Performed expected output	Passed
Login	Login	01/05/21	OP7	All fields are filled but invalid	Prompt message that input is invalid	Performed expected output	Passed

Table 18.1

UNIT TESTING – OPERATOR cont'd

Login	Login	01/05/21	OP8	All fields are not filled and invalid	Prompt message to fill all fields	Performed expected output	Passed
Logout	Logout	01/05/21	OP9	Tap logout button	Successfully logs out operator	Performed expected output	Passed
View Profile	View Profile	01/05/21	OP10	Tap view profile	Displays operator profile	Performed expected output	Passed
View Profile	Edit Profile	01/05/21	OP11	Tap edit button on profile activity	Allows operator to input profile fields	Performed expected output	Passed
Operator Homepage	Homepage	01/05/21	OP12	Tap navigation menu	Displays navigation drawer	Performed expected output	Passed
Operator Homepage	Homepage	01/05/21	OP13	Tap requests tab	Displays a list of requests	Performed expected output	Passed
Add Driver	Add Driver	01/05/21	OP14	Tap add driver in navigation drawer	Allows operator to add a driver	Performed expected output	Passed
Add Carpool	Add Carpool	01/05/21	OP15	Tap add carpool in navigation drawer	Allows operator to add a carpool	Performed expected output	Passed

Table 19

UNIT TESTING - DRIVER

Module Name	Unit Name	Date Tested	Test Case ID	Test Case Description	Expected Result	Actual Result	Remarks
Login	Login	01/05/21	DR1	All fields are filled and valid	Proceed to next step	Performed expected output	Passed
View Profile	View Profile	01/05/21	DR2	Tap view profile	Displays operator profile	Performed expected output	Passed
View Profile	Edit Profile	01/05/21	DR3	Tap edit button on profile activity	Allows operator to input profile fields	Performed expected output	Passed
Driver Homepage	Map View	03/31/21	DR4	View passengers location in map	Show passengers location in map	Performed expected output	Passed

Table 19.1

UNIT TESTING – DRIVER cont'd

Logout	Logout	01/05/21	DR5	Tap logout button	Successfully logs out driver	Performed expected output	Passed
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Integration Testing

Integration testing is a test unit of software that as a group integrates and measures individual units. The purpose of this test stage is to find errors in embedded unit interaction. The table below demonstrates the integration of the two modules and will yield good results if running together.

Table 20

INTEGRATION TESTING

Test Case ID	Module 1	Integration Process	Module 2	Precondition	Result	Remarks
	Register (User/Operator)	Input valid information	Login	All users are successfully registered	Performed expected output	Passed
	Login (User/Operator)	Input valid information	View Profiles	All users are logged in	Performed expected output	Passed
	Login (User)	Input valid information	Browse Carpools	All users are logged in	Performed expected output	Passed
	Login (User)	Input valid information	Check carpool status	All users are logged in	Performed expected output	Passed
	Login (Operator)	Input valid information	Add driver	All operators are logged in	Performed expected output	Passed
	Login (Operator)	Input valid information	Add carpool	All operators are logged in	Performed expected output	Passed
	Login (Operator)	Input valid information	View requests	All operators are logged in	Performed expected output	Passed
	Login (Operator)	Input valid information	View owned carpool	All operators are logged in	Performed expected output	Passed

Table 20.1

INTEGRATION TESTING cont'd

	Login (Driver)	Input valid information	View all subscribed passengers	All drivers are logged in	Performed expected output	Passed
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Alpha Testing

Alpha testing is defined as a type of software testing conducted before releasing the item to actual customers or the public to detect bugs.

Table 21

ALPHA TESTING

Test Criteria	Poor	Fair	Good	Very Good
Graphical User Interface (GUI)				
Consistency (The user interface is of the same formatting style and icons throughout the system)				
Forgiveness and Tolerance (The interface displays message or confirmation prompts that would allow the user to undo or redo critical actions.)				
Reusability (The system contains reusable GUI components such as familiar buttons, text and checkboxes, and other tools.)				
Simplicity (The GUI design includes simple GUI buttons, such as simple screens with clear, uncrowded messages.)				
Readability (The interface has appropriate colors, font sizes and styles that are convenient to the target users.)				
Rity (Displayed error, help, and warning messages are clear, concise, and as elementary as possible to assist users in operating the software.)				
Flexibility (The system includes user preferences setting to allow changes, for example, increasing the font size.)				
User-friendliness (The GUI design must be user-friendly, by providing helpful, courteous, and non-offending messages.)				
System Performance				
Conformance to the Requirements (The system effectively met all the identified features and/or requirements.				
Conformance to the Objectives (All specific objectives of the system are met by the program.)				
Efficiency (The entire system functions efficiently. It doesn't have a delay in any transaction.)				

Table 21.1

ALPHA TESTING cont'd

Security (The system is secured. Login details are authenticated. Input parameters are ensured prior to the execution of the next transaction				
Integrity (The software allows a registered user to have control over its own private information.)				
Overall Impression (In general, the program or system is functional and useful.)				

Table 28 shows the alpha testing done on the SchoolTranspo mobile app. It tests both the back-end and the front-end section of the application from poor to very good. This testing makes sure that the product is ready for deployment therefore done before a product is deployed.

Acceptance Testing

Acceptance testing is a formal evaluation with regard to the needs of users, requirements, and business processes conducted to determine whether or not a system satisfies the acceptance criteria and to enable the user, customers or other authorized entity to determine whether or not to accept the system.

Implementation/Deployment Phase

The implementation/deployment phase shows the activities performed by the proponents in the user's environment when the system was already tested. It also includes the different specifications such as cost, software, and human resources specification and the user manual which is a step by step, per user interface guide on how the mobile application works, on how it is installed, and the necessary system information essential in running the application.

Implementation Budget/Cost Specification

This section shows the overall expenses spent during the implementation of the project.

TABLE 22
COST SPECIFICATION

Unit	Quantity	Cost
DDR4 RAM (8gb)	2	4400php
HP laptop	1	15000php

Table 29 shows the expenses incurred during the project's implementation. There wasn't much hardware cost because the project mainly focuses on developing software which is a mobile application. Since the proponents mainly focused on this, the computers' RAMs had to be upgraded because Android Studio, the IDE that the proponents used throughout the development process. As for the laptop, it is required for one of the proponents to own at least unit where the proponent can at least use Android Studio.

Hardware Specification

This section presents the hardware needed in developing the application. The hardware involved will only be mobile phones or tablet which supports android version.

Software Specification

This section presents the software, programming languages both front – end and back – end, IDE platforms, and database requirements to develop the system.

SchoolTranspo will be developed using Android Studio, Integrated Development Environment (IDE) for Google's Android operating system, designed specifically for Android development. The mobile application will be using the built-in GPS to use Google Map API and Google Map Geocoding API. We will be using Java for the back – end, and firebase will be used as a database.

The programming languages and scripts that will be used are JavaScript, Java, and JSON. The mobile app will only be running on an Android Operating System and is available in Version 5.0 (Lollipop) until the latest version of the OS.

Human Resource Specification

TABLE 23
HUMAN RESOURCE SPECIFICATION

USER	
User	User may view the status of the carpool or browse available carpools. The user will be notified whether their carpool will be fetching their passenger. User can also leave feedbacks to the carpool service after the successful carpool service.
Operator	Operator may be able to add a driver, and add a carpool. Operator can also accept carpool requests and view owned carpools.
Driver	Drivers may be able to view the location of their passengers.

User Guide

This section contains the guide for the user to help them navigate through the application depending on the type of user.

1. Introduction

SchoolTranspo is a mobile application that uses Geofencing. The application provides ensured school carpooling service for the students especially for parents

who cannot take their children to their schools. It allows users to book carpools and get notified whenever the carpool is fetching the student or successfully sent the student back home.

2. System Summary

2.1 System Configuration

SchoolTranspo runs on android-based devices such as mobile phones, tablets, and other electronic devices. SchoolTranspo is compatible with version 5 of Android (Lollipop) and up to the latest release. The application requires Internet connection.

2.2 User Access Levels

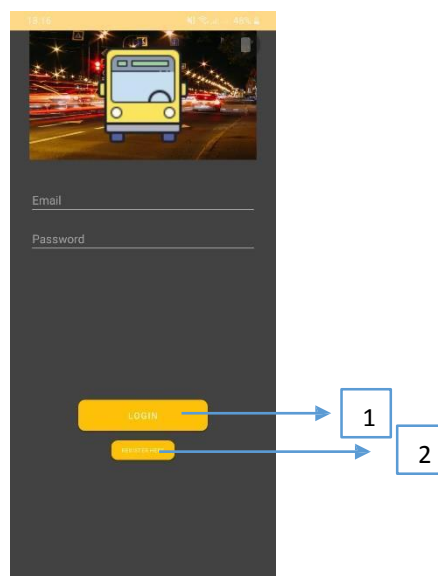
Only users who have registered through the app can use the mobile application. Access to the different features of the app will also depend on the type of user may it be users, operator, or driver. The driver can only be registered by the operator.

3. Installation

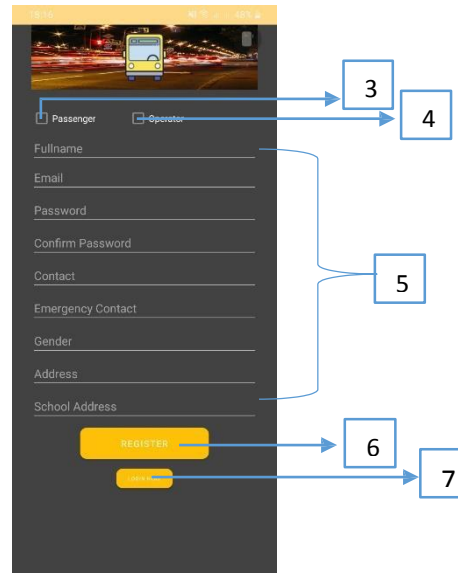
Once uploaded to the Playstore, users can download the SchoolTranspo application directly, given the device meets the requirements for software and hardware.

4. User Manual

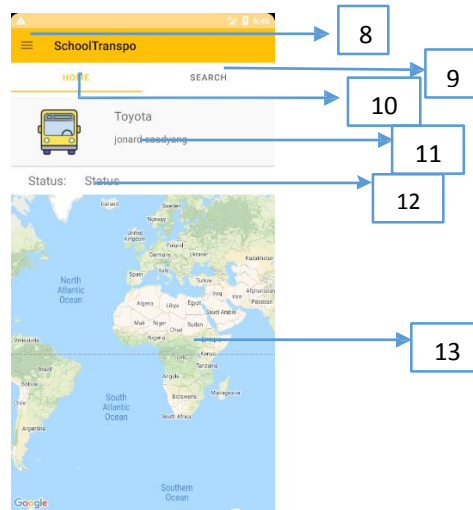
4.1 For User:



1. Tap button to log-in after inputting credentials.
2. Tap button to register as a new user.



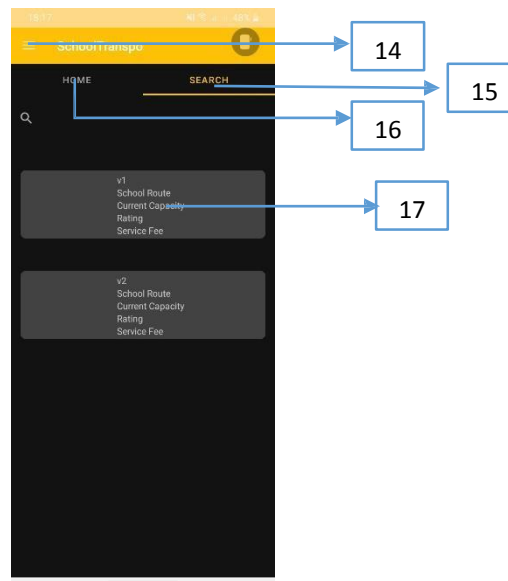
3. Tap to register as a passenger.
4. Tap to register as an operator.
5. Input user credentials.
6. Tap button to submit registration.
7. Tap to go to the log-in menu.



8. Tap to view drawer menu.
9. Tap to search for carpools.
10. Tap to view homepage.
11. Tap to view carpool profile or add a carpool.

12. Current carpool status.

13. Live tracking of carpool.



14. Tap to view drawer menu.

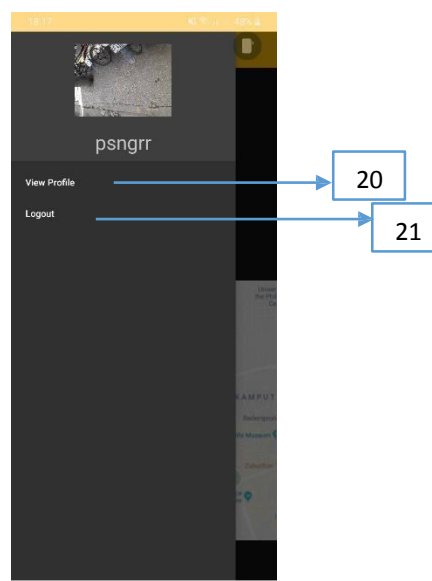
15. Tap to search for carpools.

16. Tap to view homepage.

17. Tap to view carpool profile.

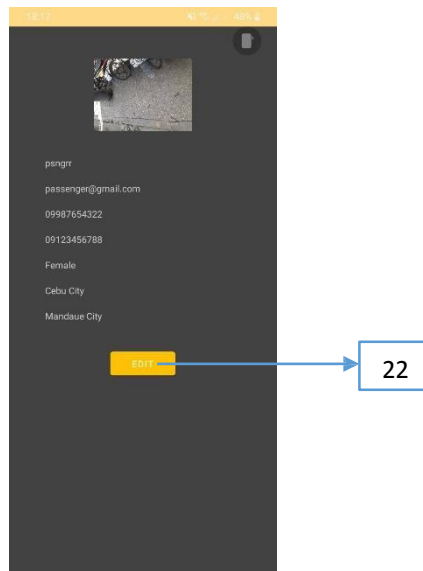
18. Tap to subscribe to the carpool.

19. Tap to pay for subscription.

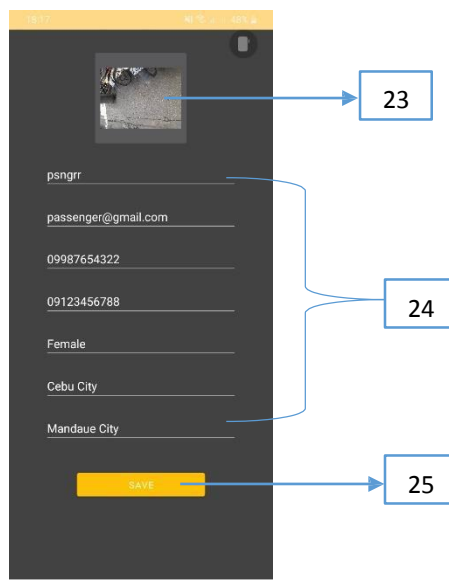


20. Tap to view profile.

21. Tap to logout.



22. Tap to edit profile.

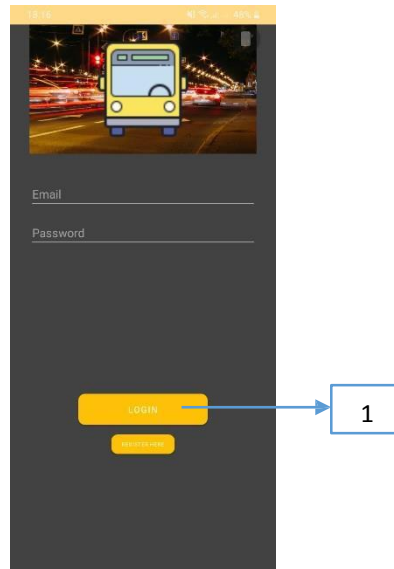


23. Tap to change profile picture

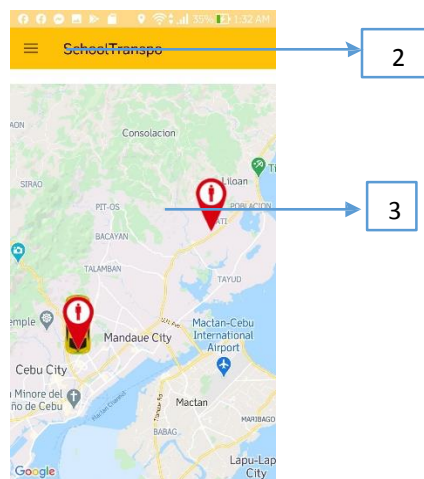
24. Input updated information.

25. Tap to save updated information.

4.2 For driver:

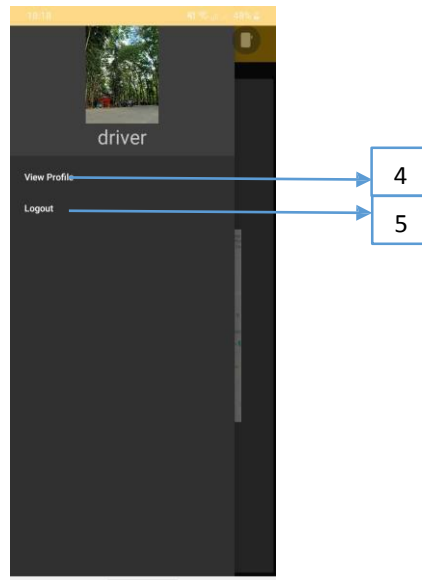


1. Tap button for login after inputting credentials.



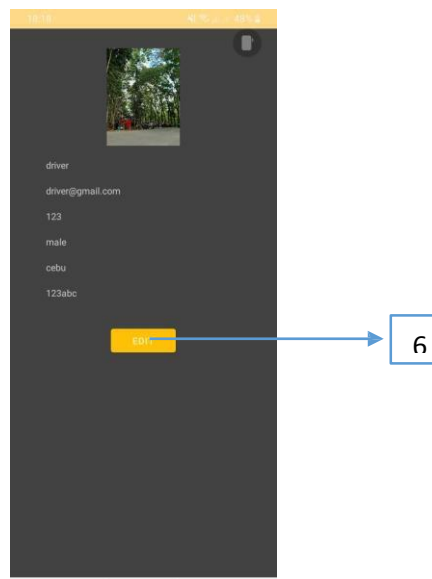
2. Tap to view navigation menu.

3. View locations of passenger and the school

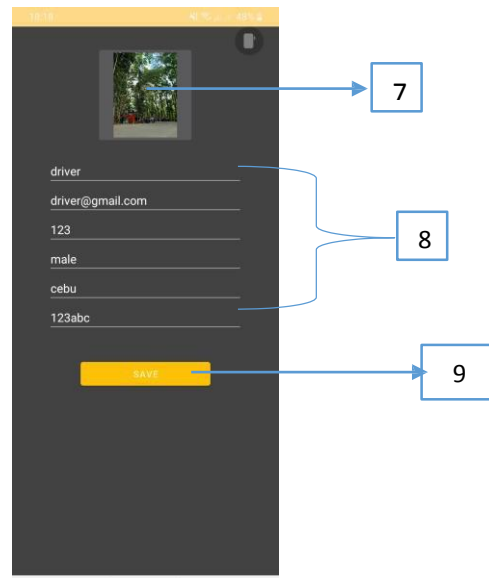


4. Tap to view profile.

5. Tap to logout.

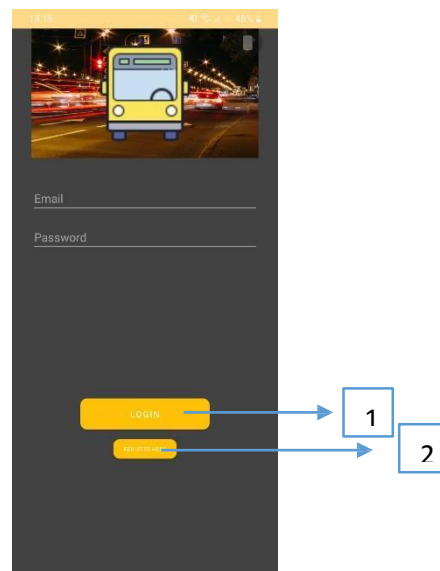


6. Tap to edit profile.

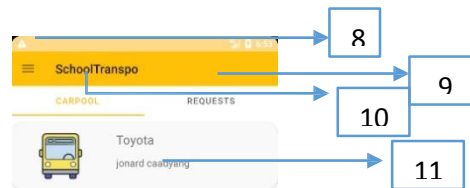


7. Tap to change profile picture.
8. Input updated information.
9. Tap to save updated information.

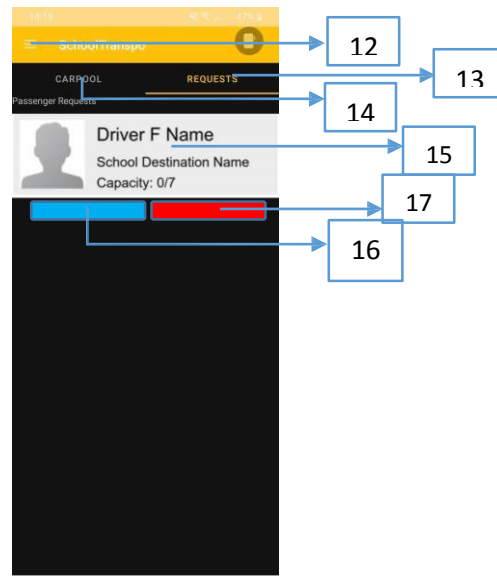
4.3 For operator:



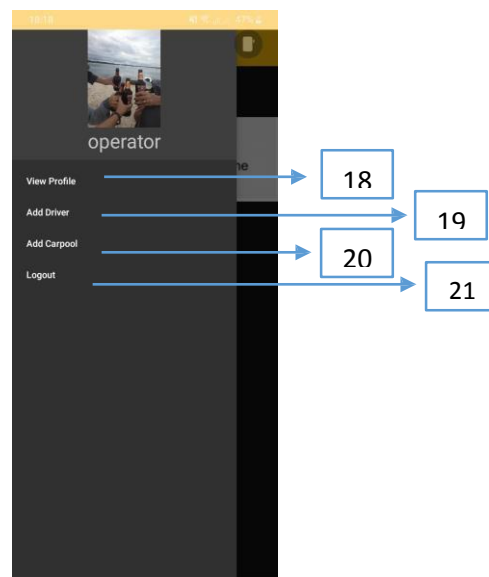
1. Tap button to log-in after inputting credentials.
2. Tap button to register as a new user.
3. Tap to register as a passenger.
4. Tap to register as an operator.
5. Input user credentials.
6. Tap button to submit registration.
7. Tap to go to the log-in menu.



8. Tap to view drawer menu.
9. Tap to view passenger requests.
10. Tap to view carpool list.
11. Tap to view carpool profile.

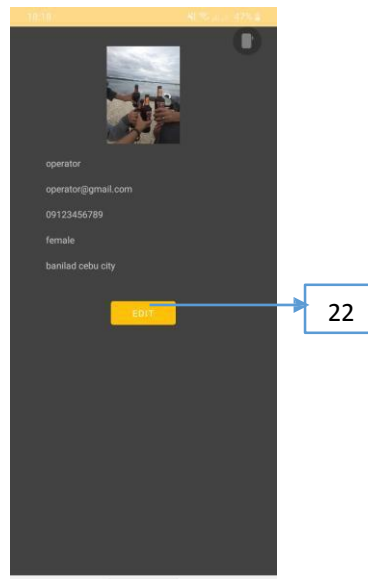


- 12. Tap to view drawer menu.
- 13. Tap to view passenger requests.
- 14. Tap to view carpool list.
- 15. Tap to view passenger profile.
- 16. Tap to accept passenger.
- 17. Tap to decline passenger.

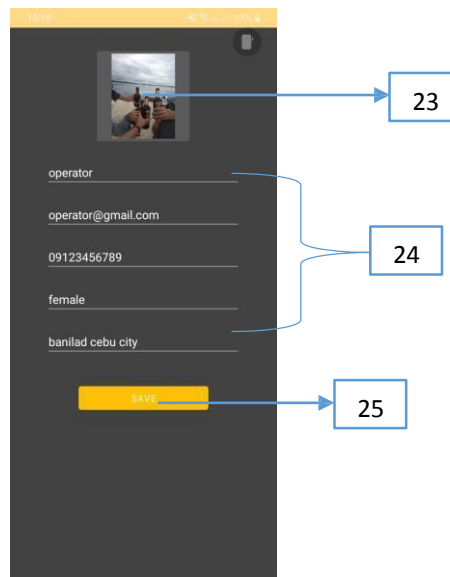


- 18. Tap to view profile.
- 19. Tap to add driver.
- 20. Tap to add carpool.

21. Tap to logout.



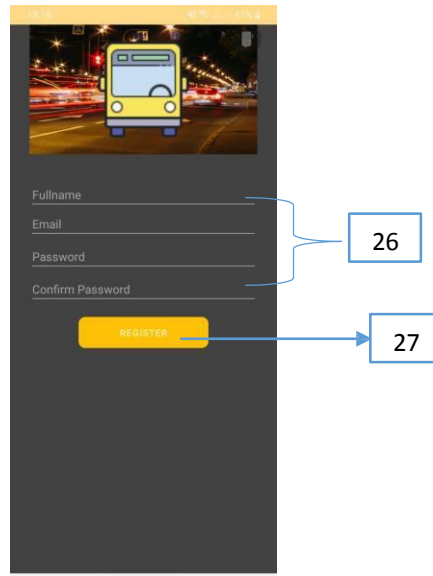
22. Tap to edit profile.



23. Tap to save profile picture.

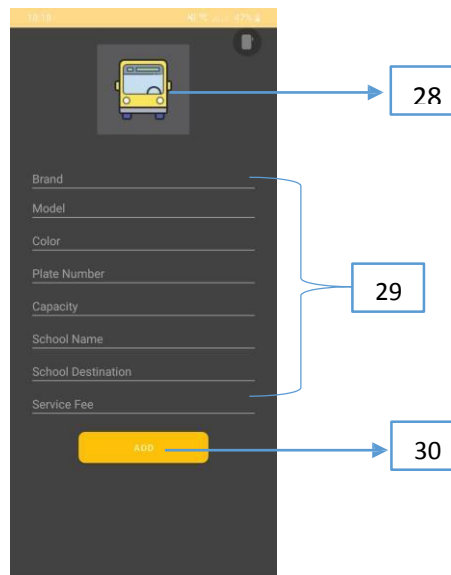
24. Input updated information.

25. Tap to save updated information.



26. Input driver login credentials.

27. Tap to register a new driver.



28. Tap to add a profile picture.

29. Input carpool information.

30. Tap add new carpool.

Installation Guide

The installation guide helps the users with the installation of the mobile application in their android phones, tablets, and the like.

1. Check device requirements

- a) Device must at least have an OS Android version 5 (Lollipop).
- b) Device must be connected to the internet.

2. Install the application

- a) Visit Play Store and download the SchoolTranspo application.
- b) Once downloaded, SchoolTranspo is now ready to use.

Project Roadmap

The project roadmap is a high-level, easy-to-understand overview of the important pieces of a project. It shows the project's goals and ambitions.



Figure 42: **Project Roadmap**

Figure 42 shows the process of SchoolTranspo into a startup. It shows the activities of what the proponets would do to build a mobile application that would be approved in the industry. It also shows that the proponets will add new features and further enhancements to improve the application. Monthly maintenance will also be performed to ensure the consistency of the application and to keep the application up and running.

CONCLUSION

SchoolTranspo was developed through a series of market validation processes such as gathering data, which includes conducting interviews and surveys. Based on the conducted study, the proponents concluded that SchoolTranspo is an effective and useful instrument to help parents take their children to school safely without worrying about taking their children to school despite of their lack of time.

RECOMMENDATIONS

Although SchoolTranspo may have useful features and API's, it still needs a lot of improvements to produce a better mobile application. Considering SchoolTranspo only runs for android platform which can only be limited to only android platform users. Hence, creating an IOS version is a big step for the project roadmap. Also for now, the application can only accept the paypal as its mode of payment, adding more payment options will also be a big step for the project roadmap. Since SchoolTranspo is a transportation service application, providing a traffic data and alternative routes could also help improve the application.

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APPENDIX A
Transmittal Letter – LTFRB



UNIVERSITY OF CEBU
B A N I L A D C A M P U S

January 07, 2020

COL. EDUARDO C. MONTEALTO, JR.
Regional Director
J. King Bldg., Jose L. Briones St., North Reclamation Area,
Cebu City, 6000

received: 1/6 11/7/20

Dear Sir:


Greetings!

We, the 4th year Bachelor Science in Information Technology students of the College of Computer Studies at the University of Cebu – Banilad Campus, is conducting a research for our Capstone Project entitled “Escort: A Mobile-Based School Carpool Services.” The said research is for our Application Development that will help passengers and carpool owners have a better communication between each other.

We humbly ask for your consent to allow us to have a personal interview with you about carpooling and its policies. We believe that this interview would strengthen the foundation of our research. Rest assured that the information gathered shall be highly kept confidential for your security and safety.

We are hoping for your kind consideration.

Sincerely yours,


James Vincent Gastador
Project Manager

Ms. Marijoy Yaun
Capstone Adviser

APPENDIX B
Consultation Log

APPENDIX C



University of Cebu – Banilad
Banilad, Cebu City, Philippines 6000
College of Computer Studies

Date: January 16, 2021

CENSOR'S CERTIFICATE

This is to certify that the undersigned has reviewed and went through all the pages of the proposed project study/research manuscript titled: "SchoolTranspo: A mobile-based school carpool services" as against the set of structural rules that govern the composition of *sentences*, *phrases*, and *words*, in the English language as well as the technical terms, syntax (format, etc.) and semantics appropriate for the Information Technology and Computing fields.

Signed:

A handwritten signature in blue ink, appearing to read 'Rechie Ople', with a period at the end.

MR. RECHIE OPLE

Grammarian

Conforme:

A handwritten signature in blue ink, appearing to read 'James Vincent Gastador', with a period at the end.

JAMES VINCENT GASTADOR

Project Manager

Noted:

A handwritten signature in blue ink, appearing to read 'Marijoy Yaun', with a period at the end.

MS. MARIJOY YAUN

Adviser

APPENDIX D
Survey Questions

SCHOOL CARPOOL SURVEY

This survey aims to gather information about the different struggles of carpool drivers and passengers.

Please answer accordingly.

Name of Carpool Driver / Passenger _____

For Carpool drivers, how long have you been a carpool driver

How difficult it is to find transportation for going to school and returning home?

(Passenger)

☐ Very Hard

☐ Hard

☐ Easy

☐ Very Easy

How difficult it is to find passengers? (Carpool Driver)

☐ Very Hard

☐ Hard

☐ Easy

☐ Very Easy

How satisfied are you on your journey going to school and going home? (Passenger)

☐ Very Satisfied

☐ Satisfied

☐ Dissatisfied

☐ Very Dissatisfied

How hard it is to promote your carpool service to students/ school employees? (Carpool Driver)

☐ Very Hard

☐ Hard

☐ Easy

☐ Very Easy

Would it be helpful to have an app to promote your services to many people? (Carpool Driver)

☐ Very Helpful

☐ Helpful

☐ Not helpful

☐ I don't need one

How hard it is to find a carpool service? (Passenger)

☐ Very hard

☐ Hard

☐ Easy

☐

Very easy

Would it be helpful if you can find a carpool service through an app? (Passenger)

- ☐ Very Helpful
- ☐ Helpful
- ☐ Not helpful
- ☐ I don't need one

Additional Comments (Optional)

Team Profile



JAMES VINCENT GASTADOR

PROJECT MANAGER

Leads the SchoolTranspo Team's work to ensure that goals are achieved and the submission of the success criteria is met on time.



KIM JETHRO TUGONON

U.I. DESIGNER

Responsible for the visual layout and designs of the app. Ensures that the interface of SchoolTranspo's projects are efficient and user friendly.



ANGEL SHEEN SENARILLOS

TECHNICAL WRITER

Writes the documentation for the team's progress which explains in detail the functions and the design sense of SchoolTranspo.



JONARD CAADYANG

SOFTWARE ENGINEER

Advances the application by defining enhancement choices. Shares feedback from the team to improve SchoolTranspo to better its design and implementation.