CHAPTER 1
INTRODUCTION

Background of the Study

Taxis are readily available around the city, and are easily flagged down on the sides of major roads (Thetravellinghker, 2009). Travelling by taxi is more convenient than using other types of public transport. Taxi can reach one's destination and one can go all the way to anywhere, anyplace, anytime. It is quick and also save time. Moreover it is also great for going to a place when one does not know the route or when one is travelling with large luggage and that are not suitable to use with other public transport (Seesan, 2005).

The way a taxi system is supposed to work is quite simple. A passenger has to stand on the side of the road and wait for a passing taxi. When a cab comes along and stops, he/she can get in, state his/her destination and the driver silently begin to drive. Upon reaching the destination, the driver charges the amount on the meter, the passenger pays and get out. It is all supposed to happen in that order every time.

According to the law, there is not supposed to be any negotiation about price, and the driver does not have a choice, whether or not to get the passenger. As a public service, and more importantly, as an integral part of the public transportation system, this is the way it is supposed to work. In fact, this is the way it does work in many cities around the world.

In Metro Manila however, the reality is quite different. For the average taxi passenger, difficulties start even before they board the vehicle. Despite a law that clearly prohibits the practice taxi drivers openly choose which passengers they will stop for, driving right past the others. And when a driver does stop, he expects and often demands passengers to state their destination and negotiate a price, even before allowing them into the vehicle. Passengers have about a 50/50 chance of being accepted. But just as often the driver just shakes his head and drives away, leaving a helpless passenger standing in the street, sometimes even in the pouring rain.

Once inside the taxi, it is another gamble to see if the driver turns on his meter. Some do, but most do not. Again, the law is clear but there does not seem to be any serious effort to enforce it. Asking a driver to use the meter can lead to an argument, which most Filipinos prefer to avoid. In most cases, drivers just dictate the fare.

The standard operation of a taxi transportation is to provide the professional transportation service that people want. Drivers must not select or choose passengers, must not argue about the fare, and must not refuse to take passengers to their destination (Brown, 2015).

The researchers are considering to help taxi passengers. Through a mobile application since most people have their smartphone. They can easily install the application in their mobile phones and go. It serves everything that passengers need when they use taxi service. This app will aim to help passenger save money, able to share their fare and view their route.

Statement of the problems

The following statements will describe the passengers' problem on taxi transportation:

1. There are no means of communication wherein passengers could find someone that will share and negotiate taxi fare.

2. The passenger cannot determine and estimate the travel from origin to destination.

3. The passenger are usually tricked with the route, the driver is driving through which will cause expensive fare.

Objectives of Study

This study aims to develop a taxi sharing mobile application via GPS. Specifically, it aims:

1. To develop a system that allows communication between passengers who are willing to split payment on taxi fare.

2. To develop a system that will calculate estimated ride travels   .

3. To develop a system that will show the best path from origin to destination.

Significance of the Study

The study will benefit the Passengers, Researchers and Future Researchers who will be using this project.

Passenger and other individuals will benefit on this mobile application as it will enable them to experience new type of environment. They can interact with other users and also able to keep track their progress. This system offers mobile application solutions for cheap fare and better transportation.

Researchers enrolled in this capstone research will benefit as this will serve as a review of the existing literature about share ride and travel behavior. Literature on the history of ridesharing, and share ride survey data was also reviewed. Some effort was placed on describing the 'state-of-the-practice'; identifying current rideshare service providers and comparing the type or services and technologies they are using. Finally, while there exists relatively little quantitative, time series data on ridesharing, statistics and trends have been summarized to the degree possible research involved the development of a model using commuter survey data.

Future Researchers will benefit from this study as they could also use this as related topics that are suitable for further research. It is worth emphasizing that many of these future research topics can be explored through properly designed and managed share ride trials or demonstration projects.

Scope and Limitations

     This project will deliver and develop a mobile application. The application will only request for destination from the user then it will display current location and destination and will find other users with similar destinations and similar locations.

1. User must use facebook account to log in.

2. GPS use to locate a location and by viewing Google Map.

3. User can view multiple path and can identify the shortest path

4. The system has a estimated ride travels

5. User has an option to accept or decline the request to join a ride.

6. User can create, join and modify the ride

7. User can query who he/she shared a ride with a specific date

However, the following are some of its limitations:

1. This system will work on Android smartphones.

2. The system does not allow multiple ride

3. The system only allow to use facebook account to log in.

4. The system show users information only in 300 meters

5. The system allow user only 1-3 Co-sharer can join the ride

6. The system access only in Davao City

Operation Definition of terms

Calculates Estimated Travel – The system will compute the fare, distance, and time of travels from location to destination.

Create a ride – A process that allows user create and manage a ride available to other users for sharing.

Facebook Log in – Only Facebook account can use to log in and able to use the system.

Join a ride - A process that allows other users to share a ride

Meet up place – The meeting place of the users will be decided by the one who created the ride.

Modify a ride – Allows the one who created the ride to change the ride details.

Profile – the ride records or ride logs of the user.

Ride details - Refers to the time, location, destination of a commuters.

Search input – To search a destination.

Shortest path – The system has multiple paths and the shortest path identify with the redline.

CHAPTER 2
REVIEW OF RELATED LITERATURE AND STUDIES

Related Literature

The personal transportation industry has undergone drastic changes in recent years with the introduction of application-based taxi and car service hailing systems. New industry entrants, like UBER, have made structural changes to an old industry that functioned much the same way it did decades ago, with individuals in need of a cab having to either physically wave at a taxi at the street corner or call a local car service to reserve a car at least half an hour prior to the pickup time. UBER and its competitors have made it possible to secure a car or taxi from a smartphone from any location. The following will address most of the pros and cons of these E-Hail services, like UBER (Jalloh, 2014).

Shared taxi services is not new and is already practiced informally in developing countries; drivers while taking one passenger towards the destination, take in other passengers also who are going towards the same direction . In an organized scenario while fare-splitting with friends isn't new, matching up total strangers who pay their share is. The idea of Cab-sharing is gaining more popularity after the advent of Taxi-service mobile applications around the world. With new technology features, the passenger can show his/her willingness to share a ride with another passenger (Singh, 2014).

The world's population is growing and so is the demand for resources. However as the resources are limited, there is greater pressure on existing

resources. The world is looking for innovative solutions to address these challenges by building "Sharing Economy", where people are looking to share their assets with others for charge. There has been emergence of some big brands such as Air BnB (Sharing House), Uber (Sharing Rides), ZipCar (Sharing Cars), TaskRabbit (Sharing Services) and many more. In the transportation space the new buzzword is Cab or Taxi-sharing (Singh, 2014).

Ride Sharing is pretty easy with public transportation. However, long waiting times and cramped spaces make people want to use car service instead. Ride-sharing services at their fingertips, but mostly stick with the Uber and Lyft since they are the most popular. While Uber and Lyft are great alternatives to taxis and the MTA, they can sometimes put a dent on one's wallet because of the surge in pricing (Alba, 2016).

In Hong Kong, the Taxi Council's new cab-hailing app – prosaically named Taxi – is being released at a difficult time for the business. Over the past decade, the volume of cab usage has dropped from 1.3 million daily trips to 1 million. Taxi companies and drivers have been struggling to cope with major challenges. There are constant complaints of bad service, such as overcharging and run-down vehicles. Operating costs (tyres, insurance fees and maintenance) keep rising, and they face ever stiffer competition with the expansion of the MTR network, not to mention the ride-sharing service Uber. the industry, made up of taxi companies, cab owners, agents engaged to rent and maintain the vehicles, individual owner-drivers and driver associations, has operated as

disparate units. So the industry-developed app is something of a historic development, also an associate professor at Polytechnic University specialising in public transport policy (Yau, 2016).

The taxi industry in Singapore has been dominated by established taxi companies such as ComfortDelGro. These taxi companies spend millions of dollars acquiring and building up their taxi fleet, renting them out to taxi drivers as a "subscription service". To help taxi drivers get more jobs, taxi companies have their own service center and taxi booking apps so that drivers can be better matched with passengers. a new breed of company has risen to change the way taxi booking is done: third party taxi booking apps such as GrabTaxi, Easy Taxi, and Uber. Unlike established taxi companies such as ComfortDelGro, these taxi booking apps do not have any hardware infrastructure costs, as they only facilitate the taxi booking process between taxi drivers and passengers through their mobile apps. GrabTaxi, the mobile app allows you to enter your current location and flag a taxi to your pickup location. Features in the app include booking history, a live feed of where your taxi is, as well as a taxi driver review system. GrabTaxi was founded by two Malaysian Harvard Business School graduates, who officially launched the app in Malaysia as MyTeksi in June 2012. It has since been downloaded over 1.2 million times by users in Malaysia, Thailand, Vietnam, the Philippines, and of course, Singapore (Yap, 2014).

The cities and municipalities of the Philippine are growing very rapidly. With urbanization and growth also comes increased demand for mobility.

Mobility is a key concern in various Philippine cities and municipalities. Recognizing such need, the DOTC is developing and implementing mass transport systems that can deliver safe, efficient, and reliable transport services. However, given that conventional forms of mass transport, such as urban rail, take time to implement, hence, the department will recognize new forms of transport services that can help address the large demand for transport services in expeditious and responsive ways. In addition to recognizing these new forms of transport services, there is also a need to modernize and improve transport services currently being offered to the Filipino commuting public(Jlp, 2015).

DAVAO-BASED Southern Maligaya taxi, together with its partner corporations under the R.A. Hao Group of Companies, is set to offer Davaoeños an app to make booking and riding more secure, effective, and convenient. Taxilink app is in line with its founder's vision "to provide the best quality of products and services every Filipino deserves. Maligaya is one of the first and leading taxi operators in Davao, and were still committed to being the pioneers. Taxilink is just another example of how it is constantly evolving (Perez, 2016).

Android

The Founder of Android Rich Miner and Andy Rubin. Android is known as software toolkit for smartphones. Its widely known popular OS because it is a friendly to use. Many people use android smartphone since the application is free and easy to download.

Google Maps

The Founder of Google Map Lars Rasmussen, the engineer best known as the co-creator of the hugely successful Google Maps.A route planner offers directions for users and want to take ride from location to destination. The Google Maps application program interface (API) makes it possible for Web siteadministrators to embed Google Maps into a proprietary site such as a real estate guide or community service page. Google Maps for Mobile offers a location service for motorists that utilizes the Global Positioning System (GPS) location of the mobile device (if available) along with data from wireless and cellular networks. Google Street View enables users to view and navigate through horizontal and vertical panoramic street level images of various cities around the world.

GPS

Which stands for Global Positioning System, is a radio navigation system that allows land,sea, and airborne users to determine their exact location, velocity, and time 24 hours a day, in all weather conditions, anywherein the world. The capabilities of today's system render other well-knownnavigation and positioning " technologies" – namely the magnetic compass, the sextant, the chronometer, and radio base device impractical and obsolete. GPS is used to support a broad range of military, commercial, and consumer applications.

24 GPS satellites (21 active, 3 spare) are in orbit at 10,600 miles above the earth. The satellites are spaced so that from any point on earth, four satellites will be above the horizon. Each satellite contains a computer, an atomic clock, and a radio. With an understanding of its own orbit and the clock,

the satellite continually broadcasts its changing position and time. (Once a day, each satellite checks its own sense of time and position with a ground station and makes any minor correction.) On the ground, any GPS receiver contains a computer that "triangulates" its own position by getting bearings from three of the four satellites. The result is provided in the form of a geographic position - longitude and latitude - to, for most receivers, within a few meters.

Smartphone

Smartphone is a mobile phone with an advanced mobile operating system which combines features of a personal computer operating system with other features useful for mobile or handheld use typically combine the features of a cell phone, such as the abilities to place and receive voice calls and create and receive text messages, with those of other popular digital mobile devices like personal digital assistants (PDAs), such as an event calendar, media player, video games, GPS navigation, digital camera and digital video camera. Most smartphones can access the Internet and can run a variety of third-party software components("apps"). They typically have a color display with a graphical user interface (often a touchscreen) that covers 70% or more of the front surface.

As smartphone applications (apps) continue to rise in popularity, companies are jumping for the chance to expand their customer bases by offering app versions of their products. Some companies are even undercutting themselves and offering the app version at a discount to their original product.

Here are six apps that are cheaper than the product they are modeled after (Joyce, 2010).

Social Networking Site

Alternatively referred to as a virtual community or profile site, a social network is a website that brings people together to talk, share ideas and interests, or make new friends. This type of collaboration and sharing of data is often referred to as social media. Unlike traditional media that is often created by no more than 10 people, social media sites contain content that has been created by hundreds or even millions of different people. Social Login, allow your users to login and register with one click on your website/app using their accounts from 30+ social networks

Related Systems

A taxi sharing system typically involves multiple users with the same or geographically similar (within a small distance from each other) destinations. These users coordinate through some platform to share the same taxi. This platform could be a physical or online message board, taxi stand at an airport, mobile SMS based service, or shared electronic screen in a central location. Rides can be shared to or from in-personal (hotel, airport, place of business, restaurant) destinations or personal destinations (private home). A dynamic taxi share system accommodates each individual user's trip and adjusts currently scheduled trips at any time by matching between individual user trips.

Dynamic systems use real-time information to match and schedule trips of any length at any time. In addition to personal transportation use to and from airports, conferences and other centralized locations, taxi sharing has also been used in rural communities and communities with low supply of public transportation as a substitute for a bus system. The financial considerations of taxi sharing include decreased direct and indirect costs. Direct costs are those "to the users and operators"; indirect costs are those to the society and include things like "pollution costs". Other advantages include safety (as compared to busses that do not have seatbelts) and efficiency (minimal number of stops, no transfers) and driven by individual need (Redmiles, 2011)
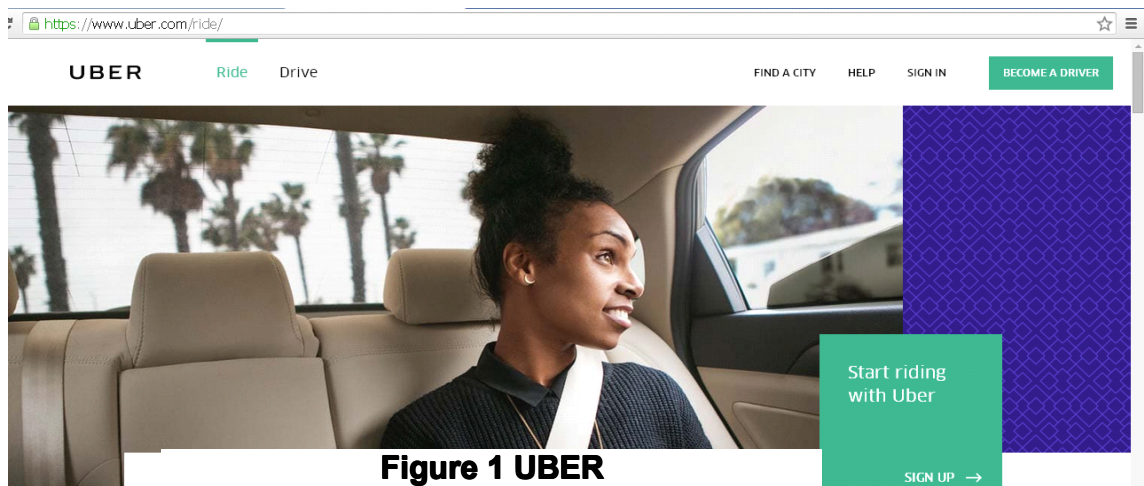
Figure 1 UBER

77 countries use uber app and the most countries active to use uber app are US, China, India, Mexico and Colombia.Uber is an on-demand car service that allows you to request private drivers through applications for iPhone and Android devices. Request ride when user ready to go a ride, user pickup location and tap request. Fare estimator can calculates a fare estimate for user next trip. Simply enter a pickup location and destination to get started and It

only accepts request ride for the same destination. User creates account using cash, credit card, PayPal, or Android Pay fare will be charged automatically at the end of a ride. It can also pay with cash in selected cities and after a trip, and email for a receipt. There is no credit card or Paypal involved, only cash will be paid on taxi fare. There is no online booking with the driver and user.
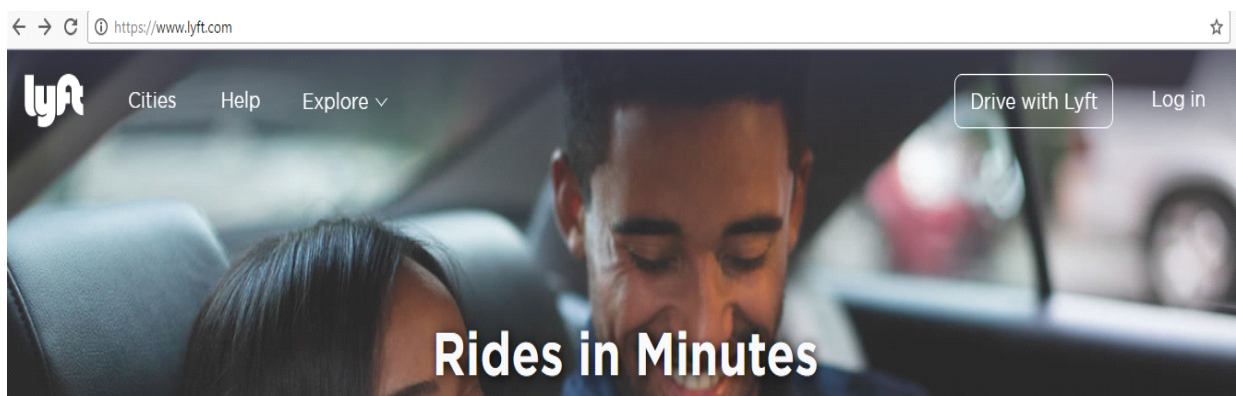

Figure 2 LYFT

nearby friendly driver who will take a passenger to his/her destination right away. It is also a shared ride and it matches with others going the same way, so they can split the cost. Price is fixed upfront and always less than original Lyft. User signs in through Facebook account and can estimate the taxi fare the user can request a ride with others in the same destination which can only be on used Android smartphones.User will sign up to log in and can request a taxi and the

driver will pick-up the user while Lyft uses iOS. It has an online booking with the driver and the user.This is used in cities abroad.
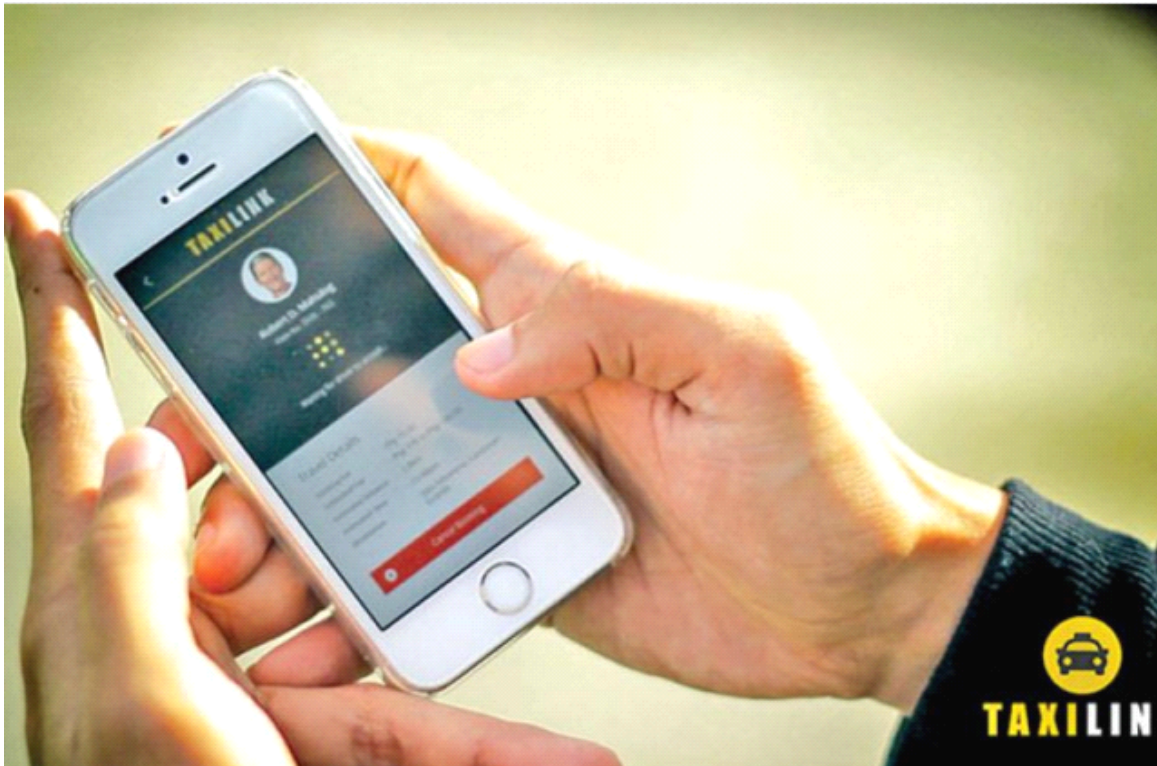

Figure 3 TAXILINK

Taxilink and proposed system are related since both use android smartphones. Taxilink is a free application use to call for taxi generating the address through GPS location. Both system can locate other usr nearby the use who requested for the ride.

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Figure 4 GRAB

GrabCar booking app revolutionizes the way people move sending a private vehicle along their way at the tap of a button. GrabTaxi is Southeast Asia's leading transportation technology app. It is the same with the proposed system which requests system users to Sign in through their Facebook account. It can estimate the taxi fare and the system using the android smartphone. User can determine the location of nearby taxi cab. Fare pay must be paid in cash.It difference with the proposed is in its availability is in its availability. Grab is available system all around the cities Asia and It is used with online booking. After setting pickup and drop-off routes, it show user to set a price for a ride. The user can also track the taxi driver and the user can log in with his/her mobile number.

CHAPTER 3
MATERIALS AND METHODOLOGY

Research Design

The research study design science to offers specific guidelines for evaluation and iteration within research projects.

Project Environment

Locale

The study was conducted at AMA Computer College. The respondents of this study were the students of AMACC Davao because they are the ones who would benefit from this study.

Population of the Study

The researchers use a survey questionnaire for one hundred sixty passenger respondents to gather the data which was used in the study.

Timetable

Table 1 Gantt chart (September 2016- April 2017)

Activities	2016				2017			
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Research	■							
Planning		■	■					
Documentation			■	■	■	■	■	■
Design and Development				■	■	■	■	■
Testing						■	■	
Deployment and implementation						■	■	
Revision							■	■
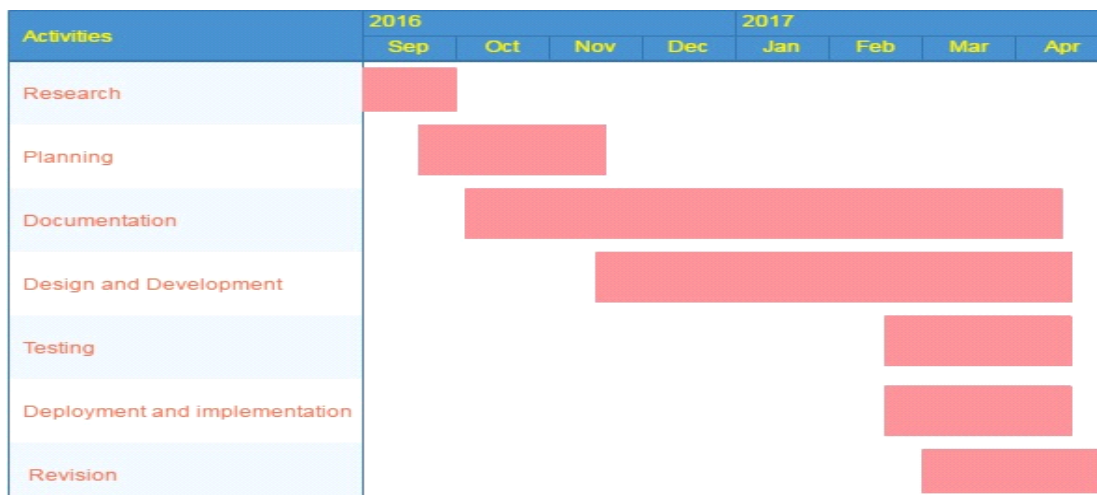
Table 1 shows the progress of the research and implementation which undergone different stages:

Research – In this stage, researchers are looking for the best subject to study in their capstone

Planning – After they find their subject, they planned on the steps to do and what to focus on to fulfill their capstone.

Documentation – Researchers documented the things that they gathered relevant to their study.

Design and Development – Design of components, modules, interface, and data for a system to satisfy specifies requirements and creating or altering systems, along methodologies used to develop the system

Deployment and implementation – Once the system was completed the system was deployed.

Revision – The panelist gave some suggestions for revision

The researchers used a survey questionnaire to analyze the result of the study. The researchers used the weighted mean because it refers to the over-all average of responses/perceptions of the respondents that would help the researchers to broadly understand and justify the need of the passenger in-terms of managing their time.

Data Gathering Procedures

The researchers conducted interviews through the use of the survey questionnaire at 123 Malvar St., Poblacion, Davao City as main instrument that is used to gather information for this study. Interviews were conducted to the passengers to identify existing problems encountered during a taxi ride.

Methodology

Requirement Specification

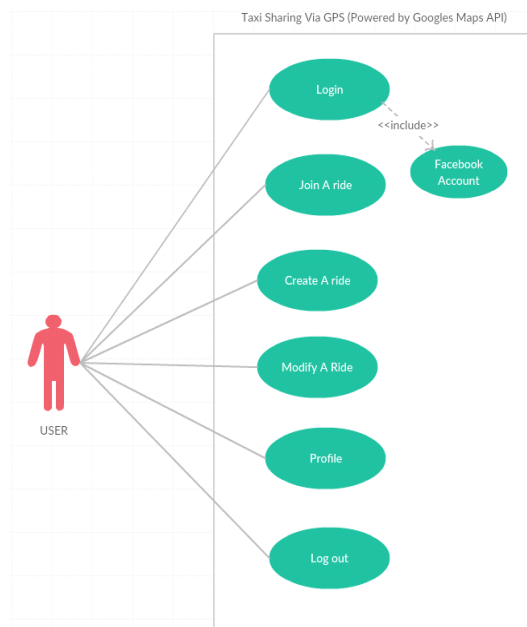Below are the requirements specification needed for the system's development. The figures are as follow:

Use Case Diagram

Figure 5 Entity Relationship Diagram

This image shows the between User and the system.

Use Case Specification

Table 2 Use Case (Log in)

ID	ID-01
Title:	Log in
Description:	Log in Facebook account to connect to iShareARide.
Primary Actor:	User
Preconditions:	The user must thave a Facebook account.
Post conditions:	Successfully login
Main Success Scenario:	1. The system ask for Log in 2. Click "Log in with facebook" button. 3. The system display window info on facebook and ask to continue. 4. Click Continue as (name of the user) button. 5. The system will navigate on Join A Ride screen. 6. Locate user current location.
Extension :	7. If the use logged in on facebook account the system will proceed on the join a ride activity screen. 8. If the user does not log in on facebook account the system navigate on facebook app to log in to continue log in.
Status:	Frequently
Owner:	User
Priority:	Low

Table 3 Use Case (Join Ride)

ID	ID-02
Title:	Join Ride
Description:	The join a ride is a main screen of the system would display user information. The user can search the desire destination and join a ride
Primary Actor:	User
Preconditions:	The user request join a ride
Post condition:	The user successfully joined a ride
Main Success Scenario:	1.The system has a search input to enter keywords of user destination 2 The system display ride information 3. Tap location pin of the user who created a ride. 4. Tap info window 5. The system navigate on next window 6. Click Join button
Extension:	6.user not allow join multiple ride
Status:	In progress
Owner:	User
Priority:	Medium

Table 4 Use Case (Create Ride)

ID	ID-03
Title:	Create Ride
Description:	The user fill up the ride information fields to create a ride.
Primary Actor:	User
Preconditions:	The user will create a ride
Post condition:	The user successfully created a ride
Main Success Scenario :	1. The system has a search input to enter keywords of user destination 2. On the join a ride activity screen have a toolbar icon to choose 3 Tap the toolbar icon and choose "Create A Ride" 4. The system will navigate on Create A Ride Screen. 5. Input text on ride information fields 6. Automatically calculates the estimated ride travels 7. Click submit button. 8. Navigate on join a ride screen.
Extension	9. Users not allow create multiple rides.
Status:	In progress
Owner:	User
Priority:	High

Table 5 Use Case (Modify a ride)

ID	ID-04
Title:	Modify a ride
Description:	The user can modify their location, destination and departure time. Recalculates the ride travels
Primary Actor:	User
Preconditions:	The user will modify a ride
Post condition:	The user updated ride successfully
Main Success Scenario :	1. On the profile activity screen in ride logs tap the toolbar icon choose " Modify " on the menu. 2. The system will navigate on Modify a Ride 3. On modify a ride screen tap to choose on toolbar icon "Modify". 4. Input text on ride information fields 5. Automatically calculates the estimated ride travels. 6. Click "Update" button.
Extension	8. The owner of the ride will allow to modify the ride 9. The owner cannot modify a ride id the user already accept to join their ride. 10. User cannot update the ride if the departure time not set on present time or future time.
Status:	In progress
Owner:	User

Table 6 Use case (Profile)

ID	ID-05
Title:	Profile
Description:	The system will record the rides details.
Primary Actor:	User
Preconditions:	Recording rides logs
Postconditions:	Ride logs recorded
Main Success Scenario:	1. In the join a ride activity screen have a toolbar icon to choose 2. Tap toolbar icon choose "Profile "in the menu. 3. The user views their ride logs. 4. On the ride log has toolbar icon choose "on ride" in the menu if the user ready or on the travel. 5. On the ride log has toolbar icon choose "Ride Complete" in the menu if the user already finish the travel
Extension	6. On the ride logs user can delete the ride logs and can cancel the ride.
Frequency of Use:	Always
Status:	Pending
Owner:	User
Priority:	Medium

Table 7 Use Case Log out

ID	ID-06
Title:	Log out
Description:	The system will record the rides details.
Primary Actor:	User
Preconditions:	The user logged in
Postconditions:	The user log out successfully
Main Success Scenario:	1. In the join a ride activity screen has a toolbar icon to choose "Log out" 2. On the profile screen activity has an icon Logout
Frequency of Use:	Always
Status:	Pending
Owner:	User
Priority:	Low

Design

Project Design

This section includes the context flow diagram and data flow diagram.
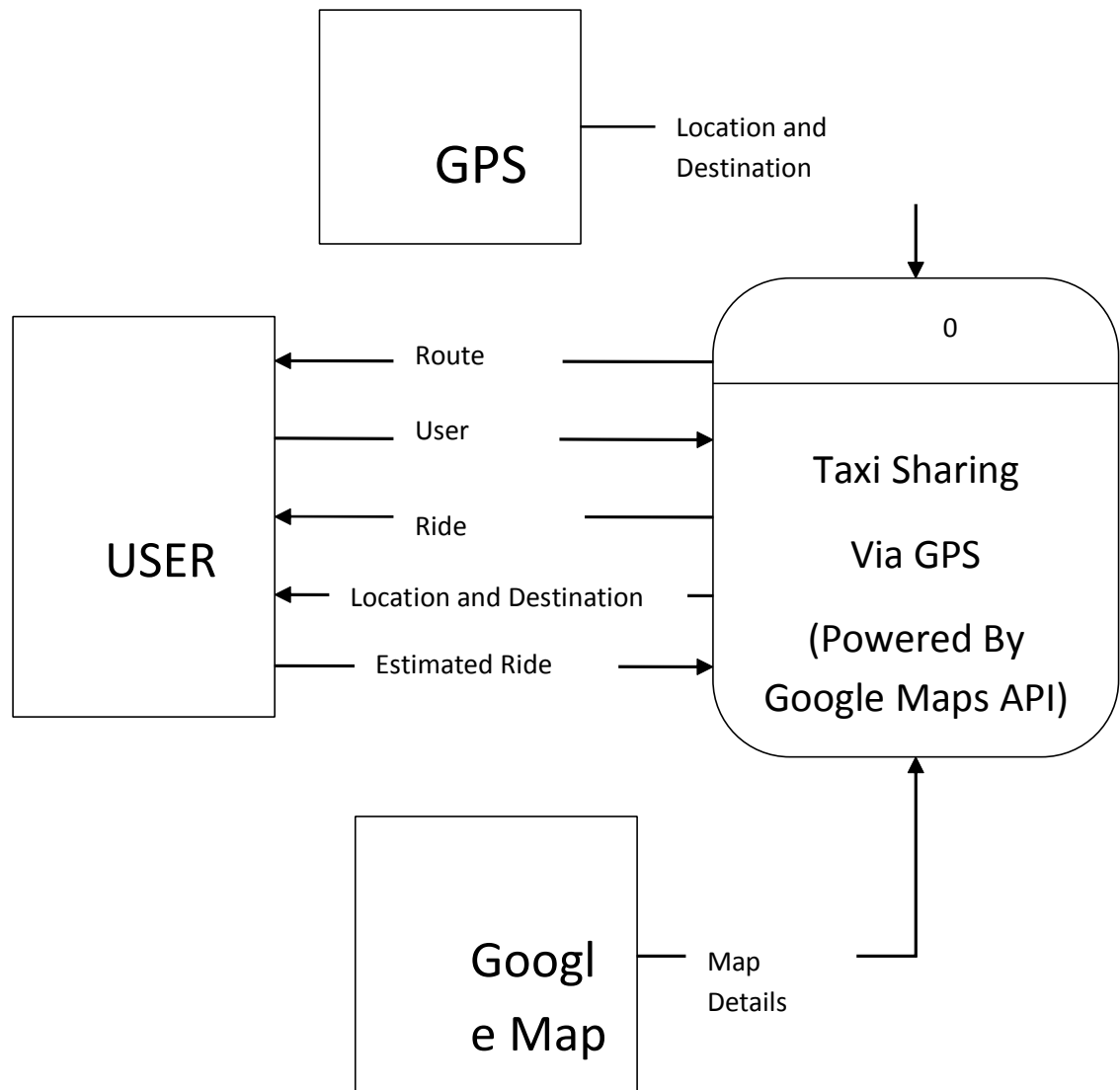
Figure 6 Context Flow Diagram

This image shows the incoming and outgoing data flows linked to participate the user. It shows the flow of the proposed system.

Data Flow Diagram
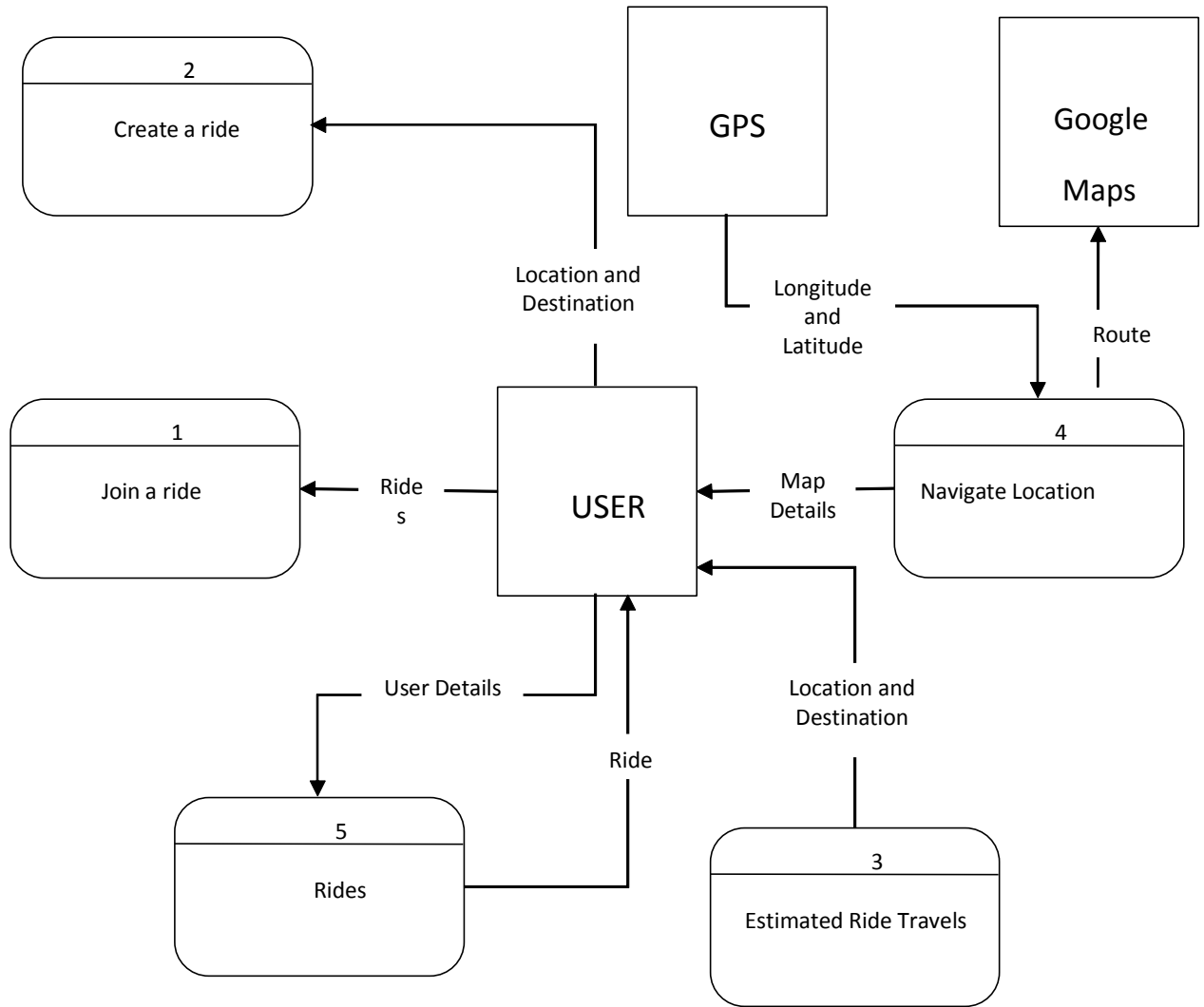
Figure 7 Data Flow Diagram Level 0

This figure shows the data flow diagram of the system. It explains what flow of the system
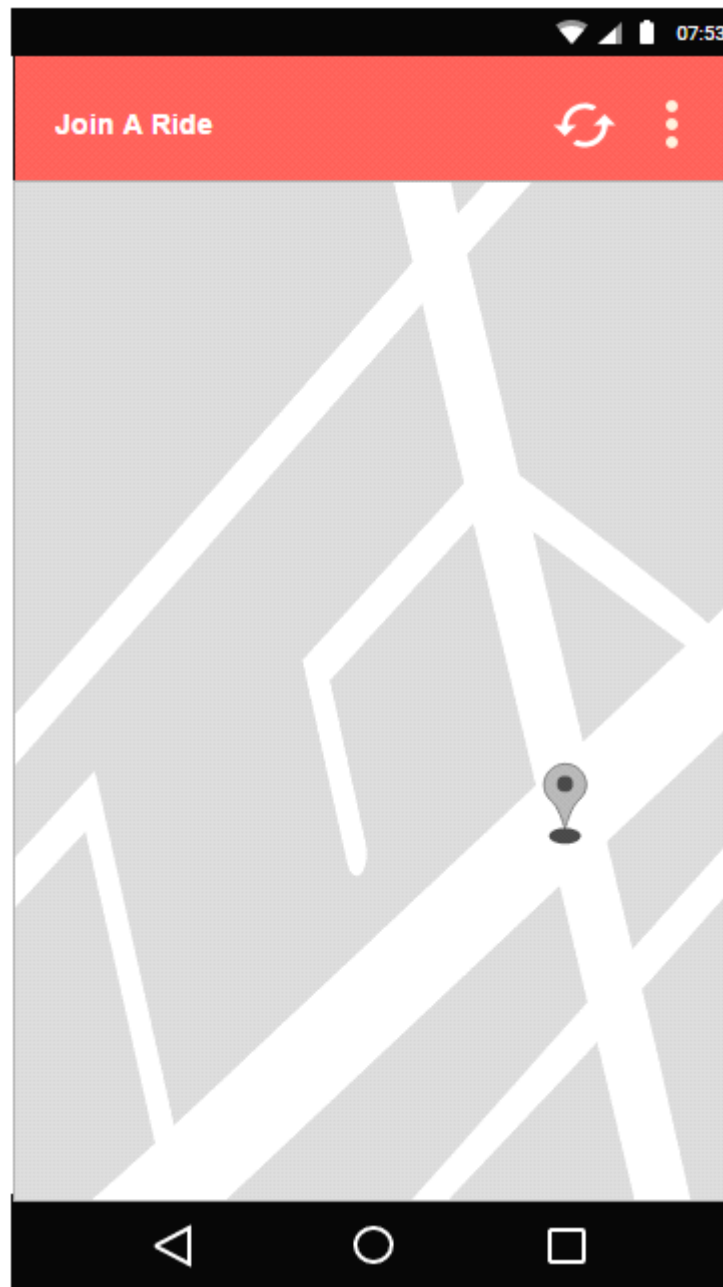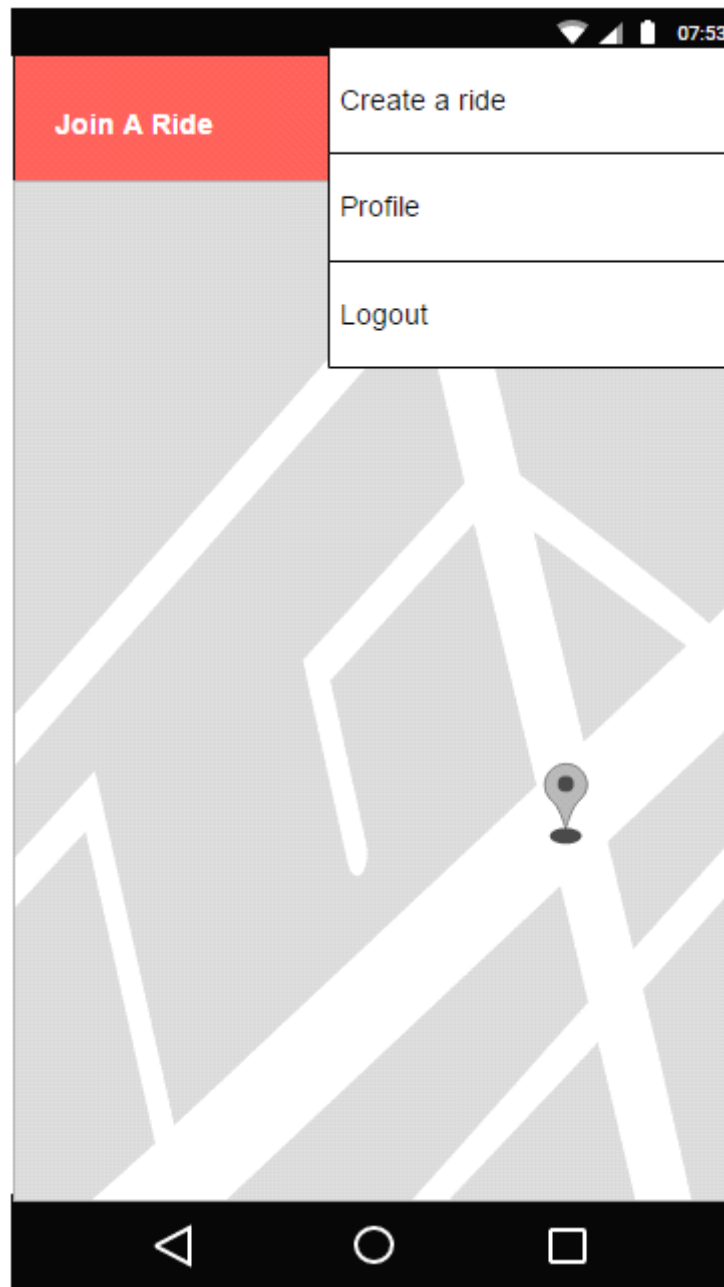
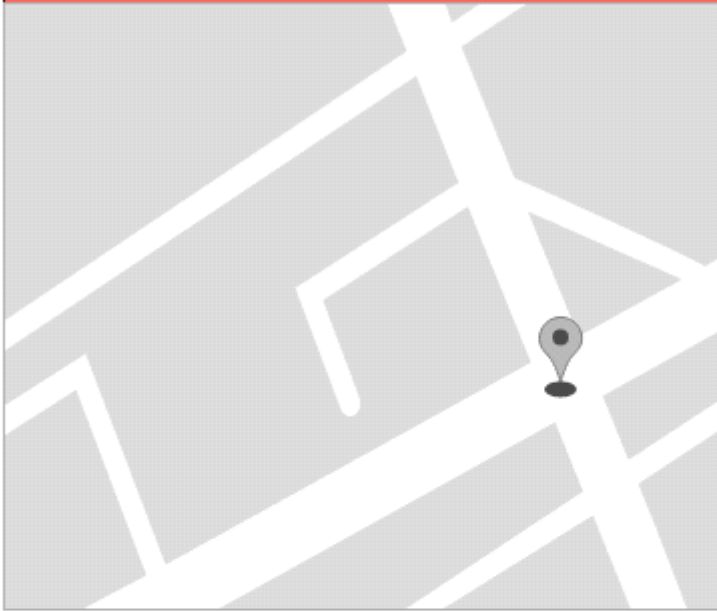Output and User-Interface Design
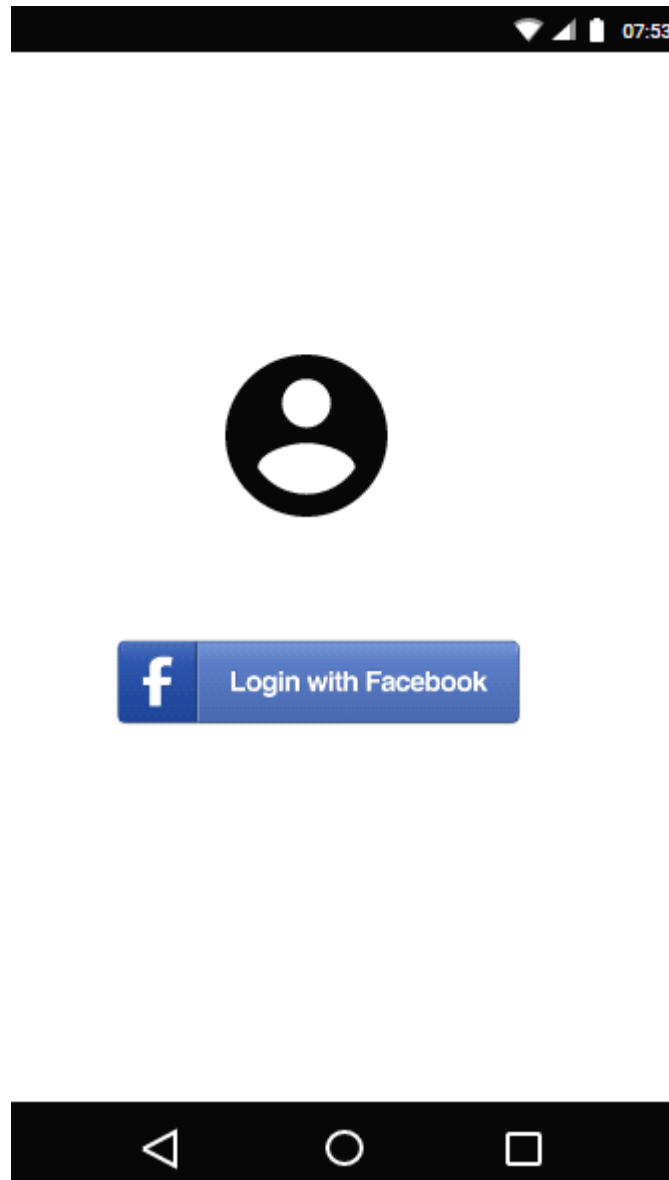
Figure 8 Log in

Figure 9 Join Ride

Figure 10 Menu

Figure 11 Create A Ride

Figure 12 Profile

Figure 13 Modify Ride

Data Dictionary

Table 8 Data Dictionary

Field Name	Caption	Data Type	Field Size
User_Name	User name	Varchar	50
Ride_ID	RideID	Int	50
Origin	Current location	Varchar	50
Destination	Desire destination	Varchar	50
Departure_Time	DepartureTime	Int	50
Estimated_fare	Estimated fare	Int	50
Num_pass	Number of passenger	Int	50
Estmated_travel	Estimated time travel	Int	50
Distance	The distance of travel	Int	50

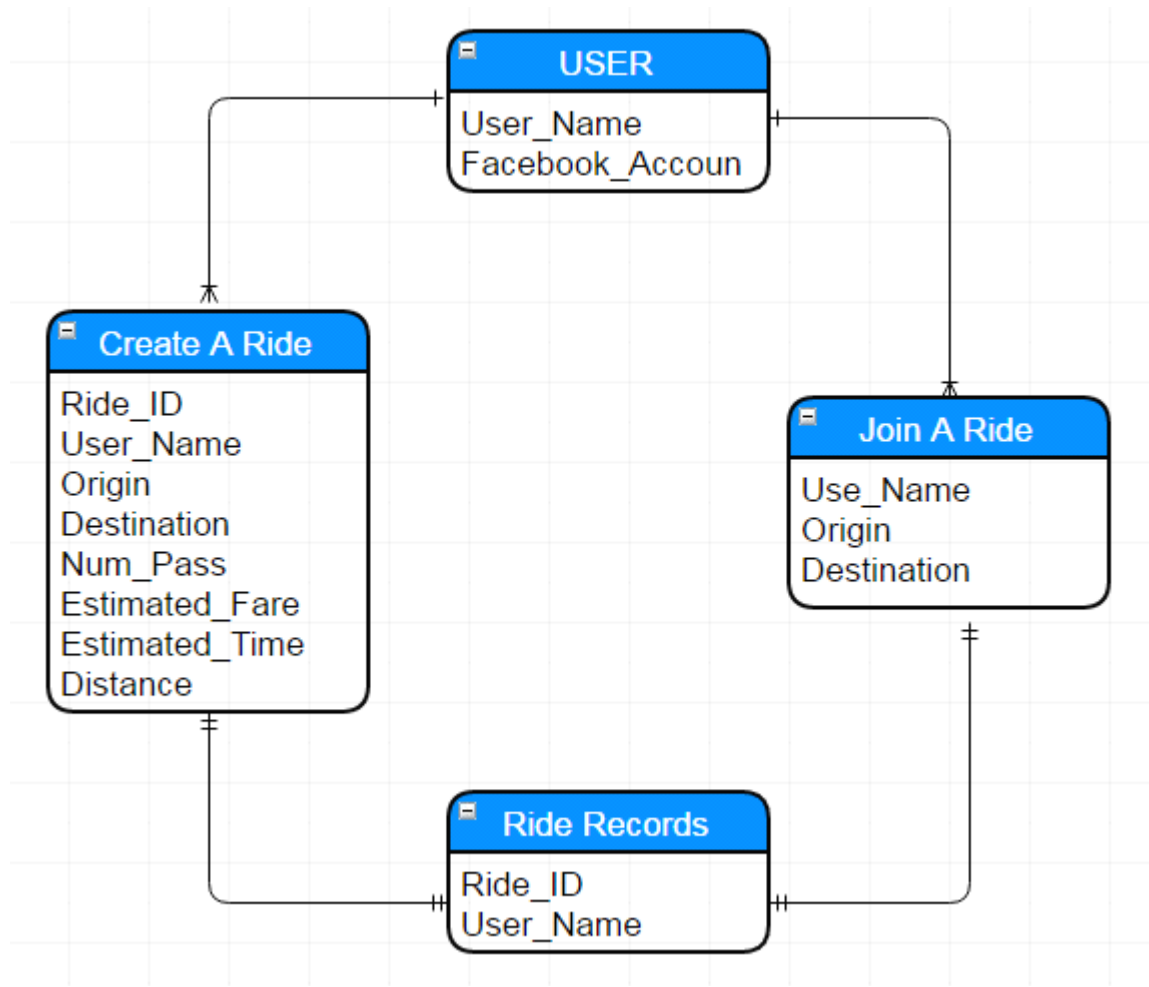**Entity Relationship Diagram**

Figure 14 Entity Relationship Diagram

Development

Software Specification

Table 8 shows the Software Specification of iShareARide: Taxi Sharing

Via GPS (Powered by Google Maps)

Mobile Device

Table 9 Mobile Device

Software Specification	
Operating System	Windows 10 Home x64-bit
.Net Framework	.NET 3.5 SP1
Database	Microsoft SQL Server 2014
IDE (Integrated Development Environment	Visual Studio Xamarin(Xamarin.Android), Microsoft SQL Server Management Studio, SQL Manager Lite for SQL Server
Programming Language	C#
Server	Windows Server 2014 Standard 64-bit

Hardware Specification

Table 10 Hardware Specification

Mobile		
Factors	Minimum	Recommended
Operating System	Android 5.0 (Lollipop)	Android 5.0 to High Version
Memory	512 MB RAM	1 GB of RAM or higher
Processor	32-bit ARMv7, MIPS or x86 architecture processor	Higher
Internet	Mobile Data (not free data)	Wi-Fi

This table shows the hardware specification of iShareARide for passengers.

Deployment Diagram

User

Internet connection

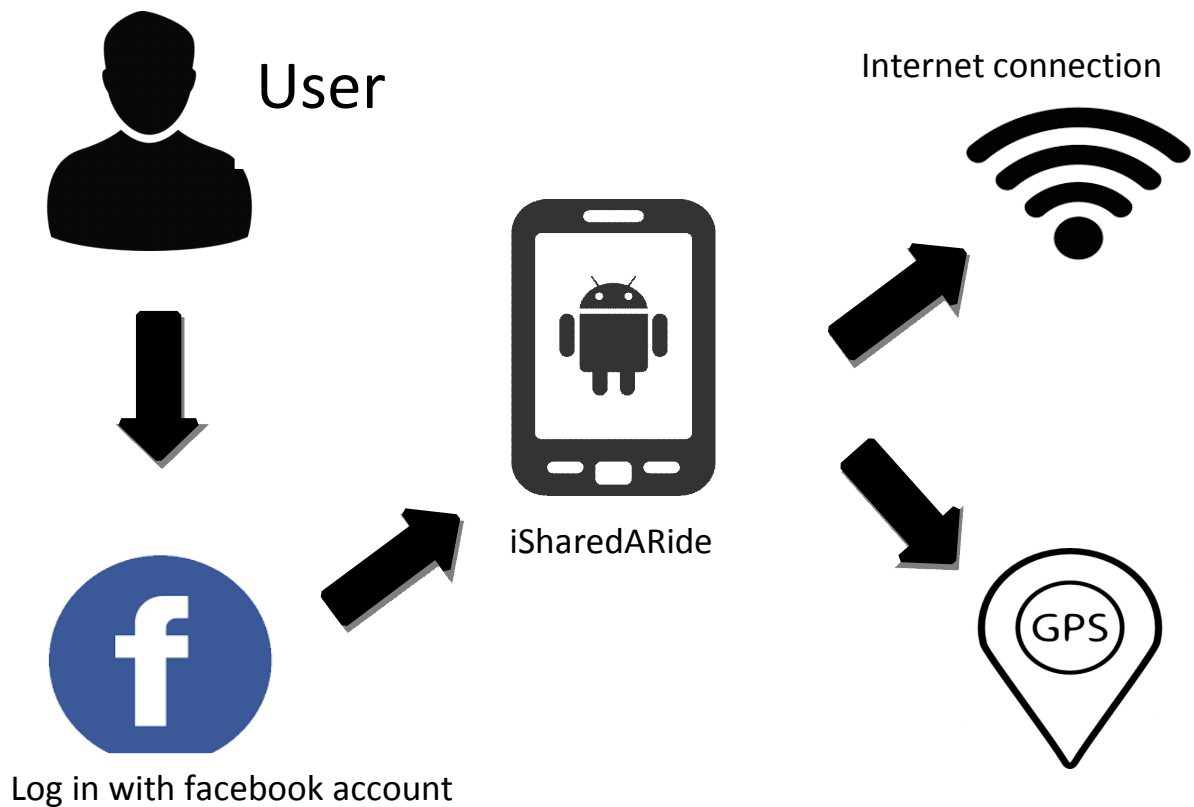iSharedARide

GPS

Log in with facebook account

Figure 15 Deployment Diagram

The figure shows the deployment structure of iSharedARide: Taxi
Sharing Via GPS (Powered by Google Maps API). In the figure above, the user
logs in with his/her Facebook account to use the mobile application. The
iShareAride must be connected to the internet and the GPS must also be
connected to allow users to locate themselves on a map, find and navigate
destinations via detailed directions.

Test Plan

Test Cases

Table 11 Test Case (Log in)

Test Case #1 Test Case Name : Log in					
Pre-Conditions:					
The user must the facebook account to log in to the system.					
Step	Action	Expected System	Pass	Fail	Comment
1	The user will open the mobile application	The system will display the log in activity.			
2	Click " Log in with facebook" button	1.The system navigate on join a ride screen if the user is regular use the system			
		2. If the user not log in on facebook account the system will navigate on facebook app to continue log in			
3	Click " Continue as (name of the user)" button.	If the user log in on facebook but the user first time use the system. The system ask to continue. The system will navigate the Join a ride screen and show the ride info.			
Post-Conditions:					
1. The system initialize the facebook account of the user info to connect iShareAride.					

Table 12 Test case (Join a ride)

Test Case #2	Test Case Name : Join a ride				
Pre-Conditions: The user joined a ride and the user can search destination					
Step	Action	Expected System	Pass	Fail	Comment
1	Click the "Search input" on the screen	The system allow user to input a keyword of the destination.			
2	Click the " Magnifier"	The system will show destination.			
3	Tap "location pin" on the screen.	The system will display the info window of user created a ride			
4	Tap the info window.	The system will navigate on full information of the user			
5	Click " Join" button	1. The system pop up message "You have successfully joined the ride" 2. If the user joining multiple ride. The system pop up a message "You cannot join another ride if you already joined to an existing ride that is open".			
	3. Tap "OK"	The pop message close			
Post-Condition: 1. The user cannot join multiple ride 2. The user can not create a ride if already join a ride.					

Table 13 Test case (Create a ride)

Test Case #3	Test Case Name : Create a ride

Pre-Conditions:

The user create a ride

Step	Action	Expected System	Pass	Fail	Comment
1	On Join a Ride screen tap the toolbar icon and tap to choose "Create a ride".	1. The system will navigate on create a ride screen. 2. If the user create multiple ride the system pop up a message "Unable Create another ride."			
2	Tap the Action button	The system will maximize the ride information fields			
3	Input text "origin" and "destination" on text fields.	The system will display a location then automatically the system will show the estimated distance, time and fare of ride travels.			
4	Input text " No. of Passenger" text fields	The system allow 1-3 number to input			
5	Long Press "Departure Time" (Now and Set Departure Time)	1. The system automatically set a present time 2. The system allow user to set departure time.			
6	Click "Submit" button.	The system will navigate on join a ride screen and the information inputted will display on the screen.			

Post-Conditions:

1. The user unable to create a multiple ride
2. The ride travel must be done to able create a ride

Table 14 Test case (Profile)

Test Case #3	Test Case Name : Profile				
Pre-Conditions: The system will records the rides travels or the rides logs					
Step	Action	Expected System	Pass	Fail	Comment
1	On the Join A Ride Screen tap the toolbar icon on join a ride screen and choose "Profile" in the menu.	The system will navigate on create Profile screen. The user can view ride logs			
2	On the ride log tap the toolbar icon choose on the menu tap "On ride"..	The system will pop up a message "You have successfully updated your ride status". If the users are already on the ride			
3	On the ride log tap the toolbar icon choose on the menu tap "Ride Complete".	The system will pop up a message "You have successfully updated your ride status". If the users are already done the ride			
4	Tap Ok	The pop up message will close			
5	On the ride logs click toolbar icon user choose "delete" in the menu.	The system allow user to delete ride logs after the ride is completed.			
Post-Conditions: 1. The user can view their ride records 2. The user can delete the ride logs if the ride is already done 3. The user update status if he/she on ride and if the already done user can update the status ride complete.					

Table 15 Test Case (Modify a Ride)

Test Case #4	Test Case Name : Modify A Ride

Pre-Conditions:					
The user can change the ride information					
Step	Action	Expected System	Pass	Fail	Comment
1	On the ride log tap the toolbar icon choose on the menu tap "Modify Ride".	The system navigates on Modify a Ride screen.			
2	On the Modify a Ride screen tap toolbar icon and tap to choose "Modify"	The system navigate on Modify A Ride Screen			
3	Input text "origin" and "destination" on text fields.	The system will display location then automatically the system will show the Distance, Estimated time of travel and Estimated fare.			
4	Input text " No. of Passenger" text fields	The system allow 1-3 number to input			
5	Click "Update" button.	1.The system pop a message "You have successfully updated your ride" 2. The system not allow to update if the departure is not set on present time or future time. The system pop up the message "Your departure time is in the past, Please change your departure time to present or future"			
6	Tap OK	The pop up message close.			
Post-Conditions:					
The user can modify a ride if the ride is not existing					

Table 16 Test Case (Logout)

Test Case #5 Test Case Name : Log out					
Pre-Conditions:					
The user can log out					
Step	Action	Expected System	Pass	Fail	Comment

1	Tap the toolbar icon on join a ride screen and choose " Logout" in the menu.	The system will exit on the program			
2	On profile screen has a logout icon	The system will exit on the program			

Post-Condition

1. The logout activity is on the Join Ride Screen and the Profile Screen

Criteria

Passed – the system met all the expected results distinguished in the description provided by the user.

Failed – the system did not meet the expected results distinguished in the description provided by the user.

Verification, Validation and Testing

The researchers verified the development and ensures that the system meets the objective and specification and delivers functionalities expected by the panelist. The researchers examined the input and outputs of the system operational behavior to check if it is performing as required. The researchers validated the system's that was approved by the panelist if it fit the intended purpose. After all the verification and validation testing that was approved, the researchers tested the system overall functionalities and defined the system behavior if it is completely stable and well maintained.

Unit testing

The unit testing is a part of system development process which involves individual testing unit of code separately to ensure the system worked on its own. Independent with other units. The researchers set essential path to performed and examine different path through modules

Integration testing

Integration testing took place on the basis of functionalities of the system, as documented in the functional specification set by the panelist. Integration testing tests integration of interfaces between components, interaction of the system different parts of the system such as the operating system, file system and hardware or interfaces between systems

System Testing

The researchers' task is to ensure the behavior of the whole system is well tested and defined the scope development. This included testing based on the requirements, specification, test cases, behavior of the system, interaction with the operating system and system resources. System testing is often the most final that the researcher has done. To ensure that the system verified and well delivered and met the objectives of the study and its purpose. The researcher tested and investigated both functional and non-functional requirements of the testing

CHAPTER 4
RESULTS AND DISCUSSION

This chapter presents the results and discussion from the methods used by the researchers in the previous chapter.

Project Description

Taxi sharing via GPS (Powered by Google Maps API) is for passenger who is willing to split their fare. This is a iShareARide Android Mobile Application. The system is capable of navigating users location and their others information. The system is user-friendly user that is similar to other mobile application. The system allows users to create a ride or accept or cancel who requests to join a ride. The application has some important features that users may frequently use, such as:

1. Create a ride

2. Join a ride

3. View ride records

4. Calculates the estimated ride travels

5. View path direction

6. Modify a ride

Project Structure
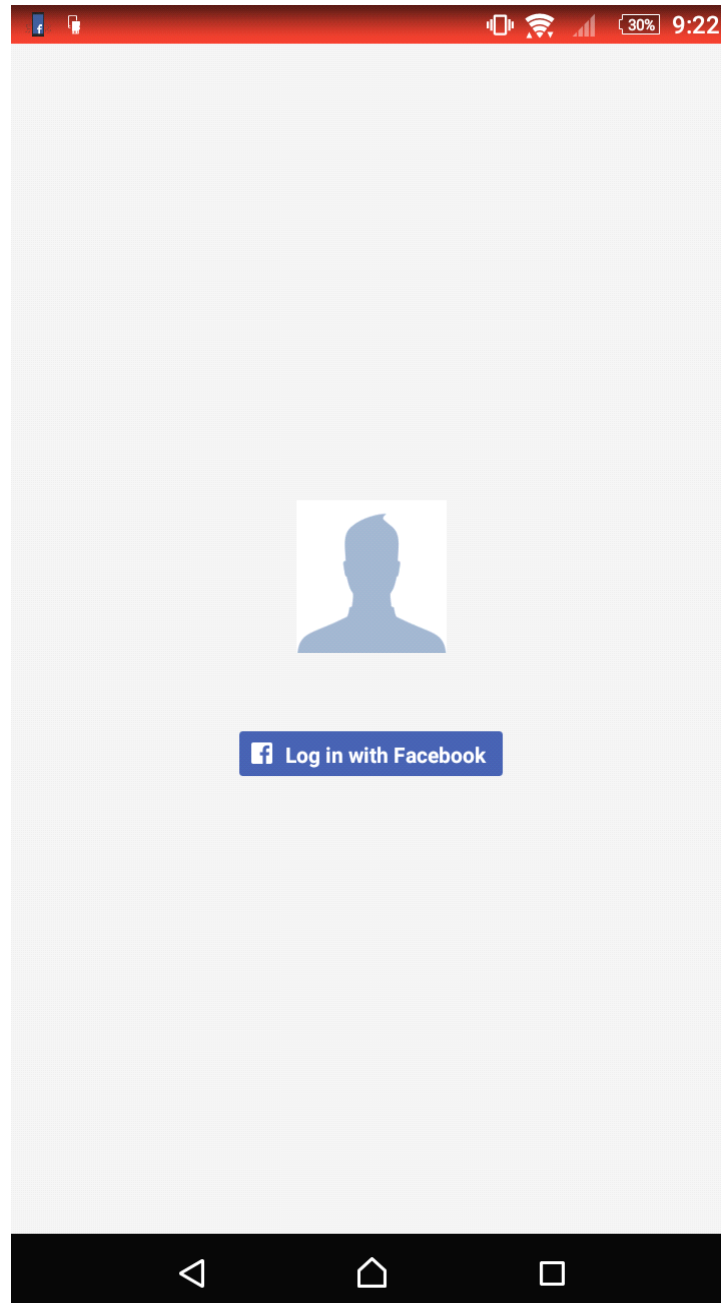
Figure 16 Login Activity
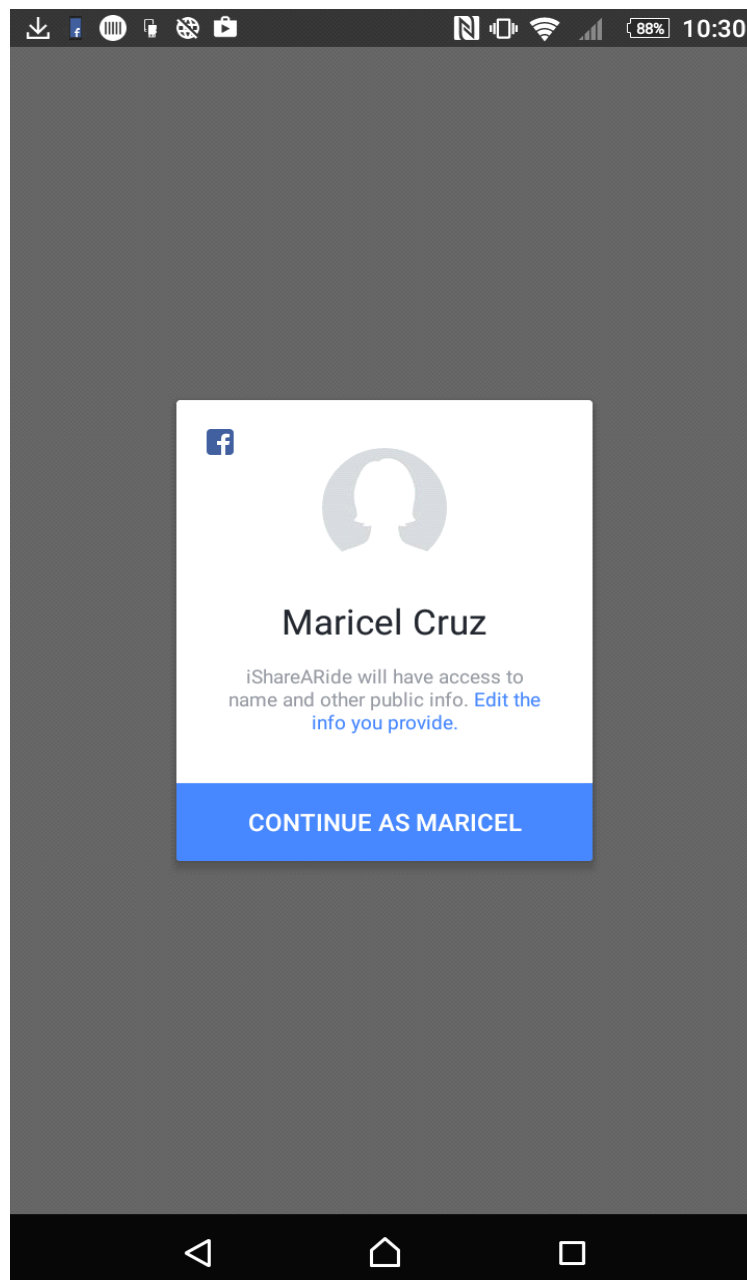
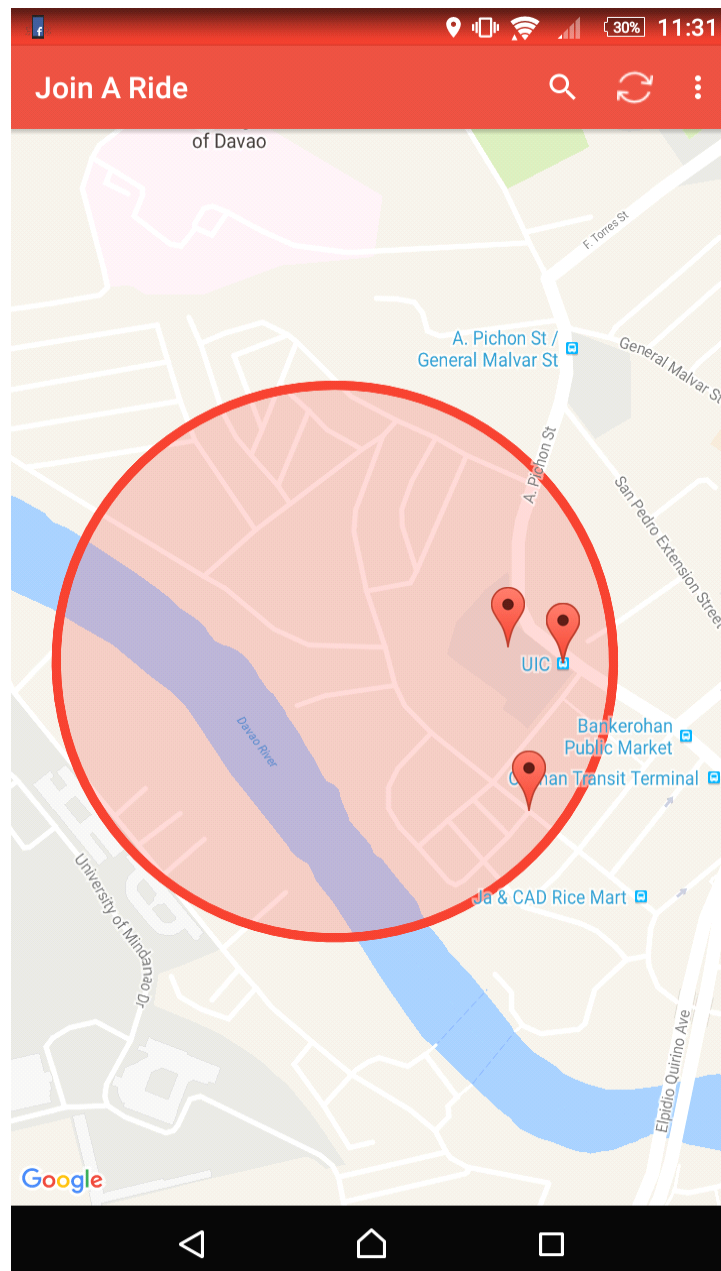**Figure 17 Login Activity 2**
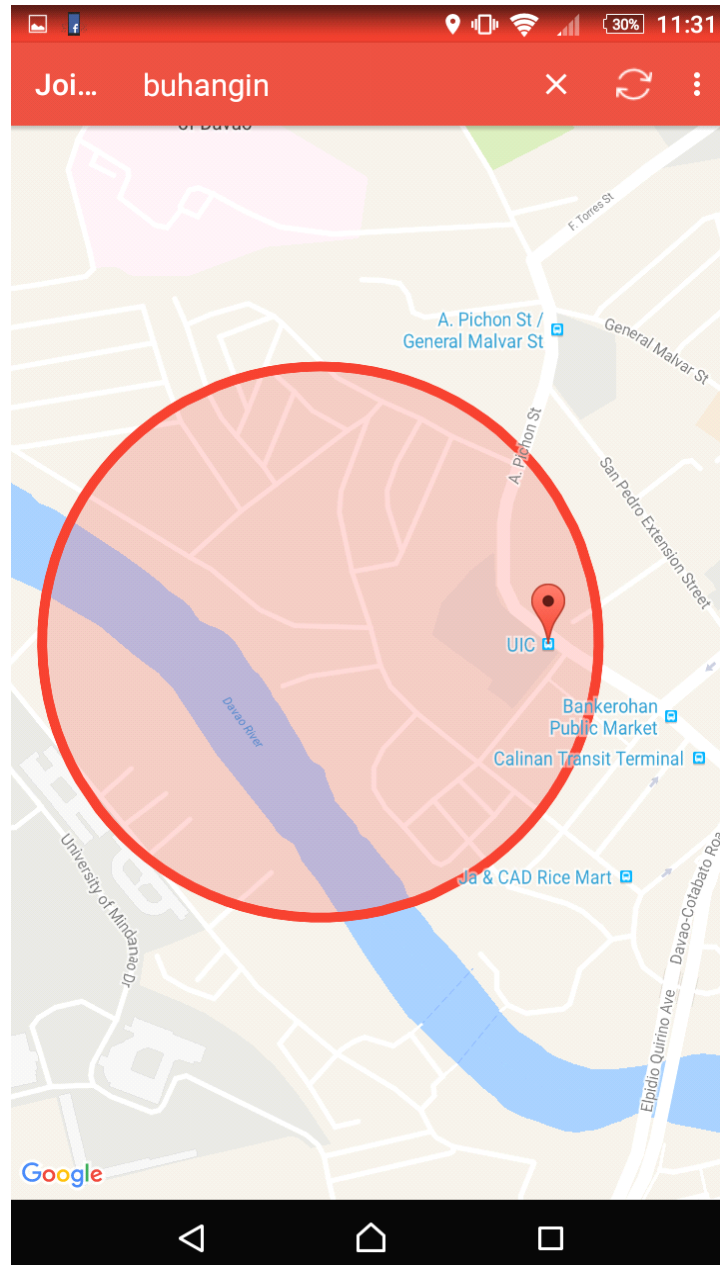
Figure 18 Join A Ride (View available Ride)

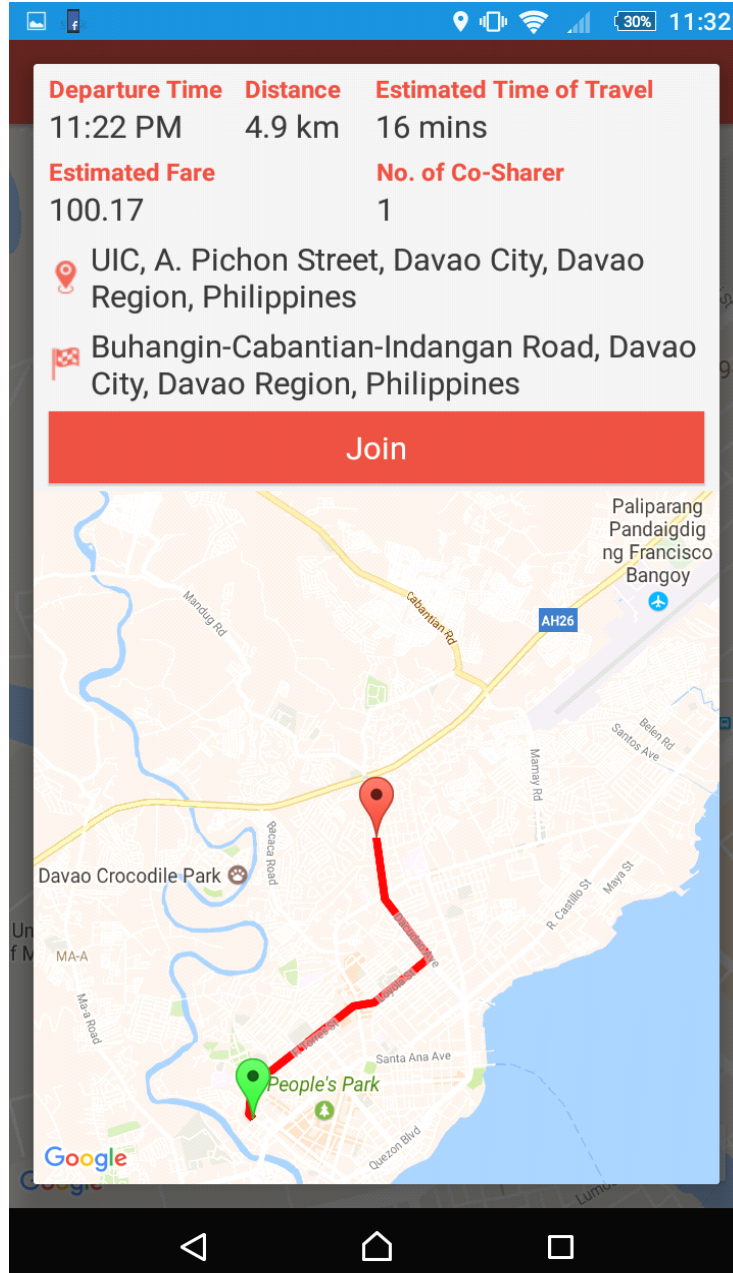**Figure 20 Join a Ride (Search Destination)**
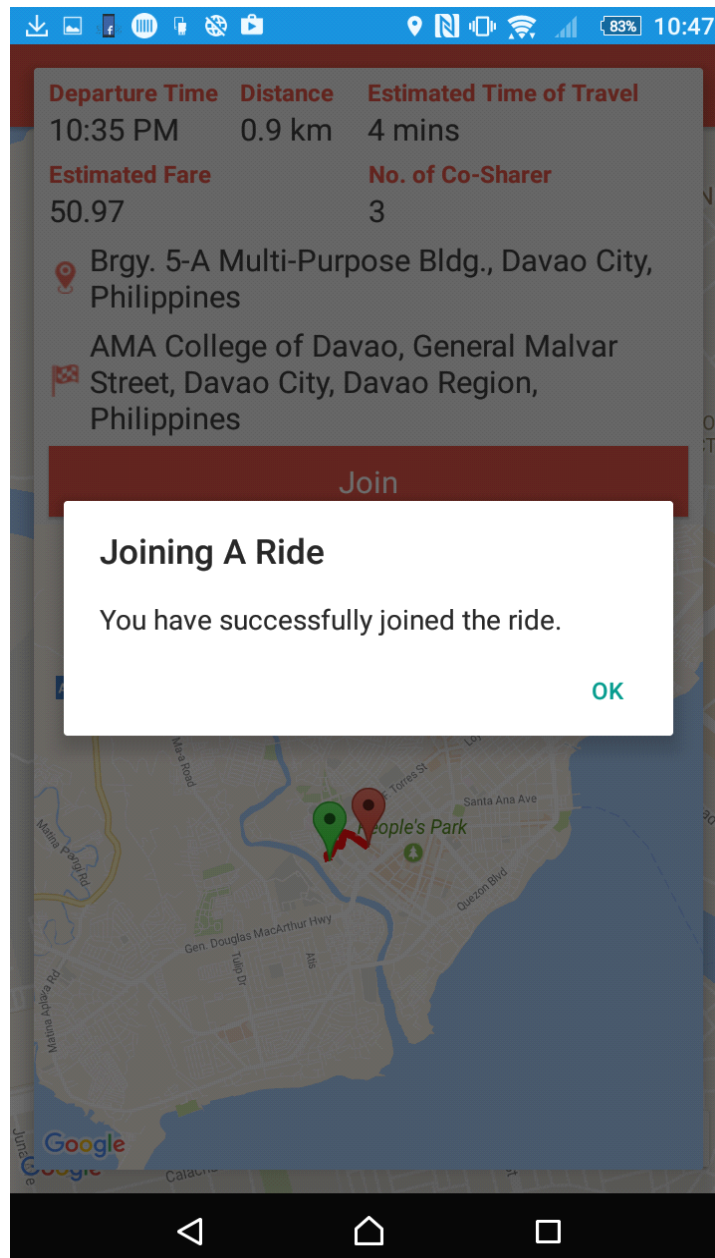
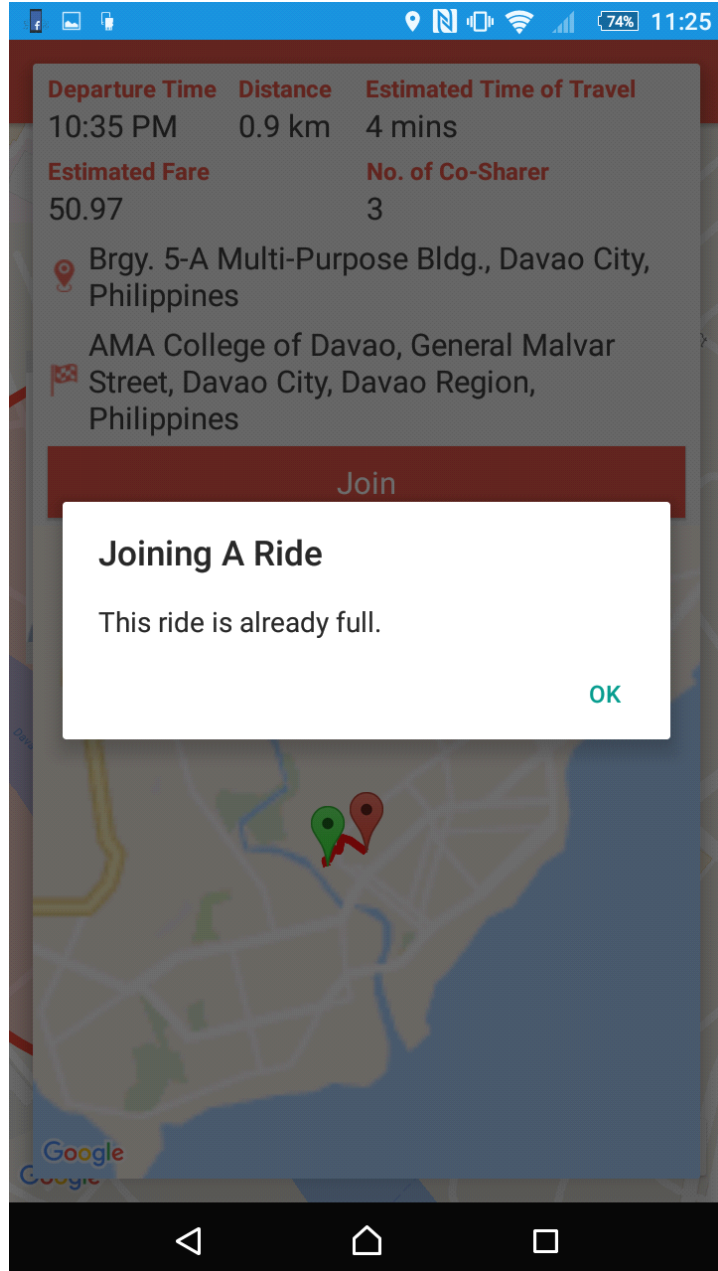**Figure 20Join a Ride (Join Button)**

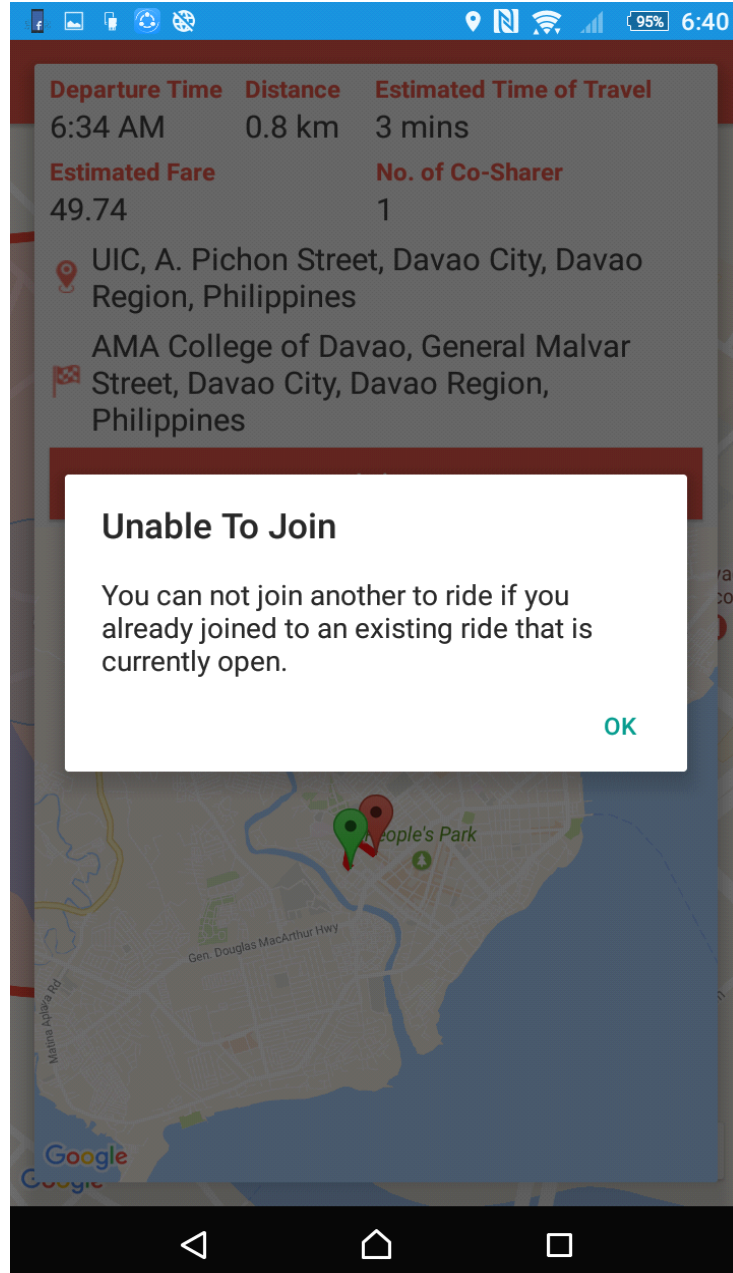**Figure 20 Join A Ride (Message 1)**

Figure 21 Join A Ride (Message 2)

Figure 22 Join a Ride (Message 3)
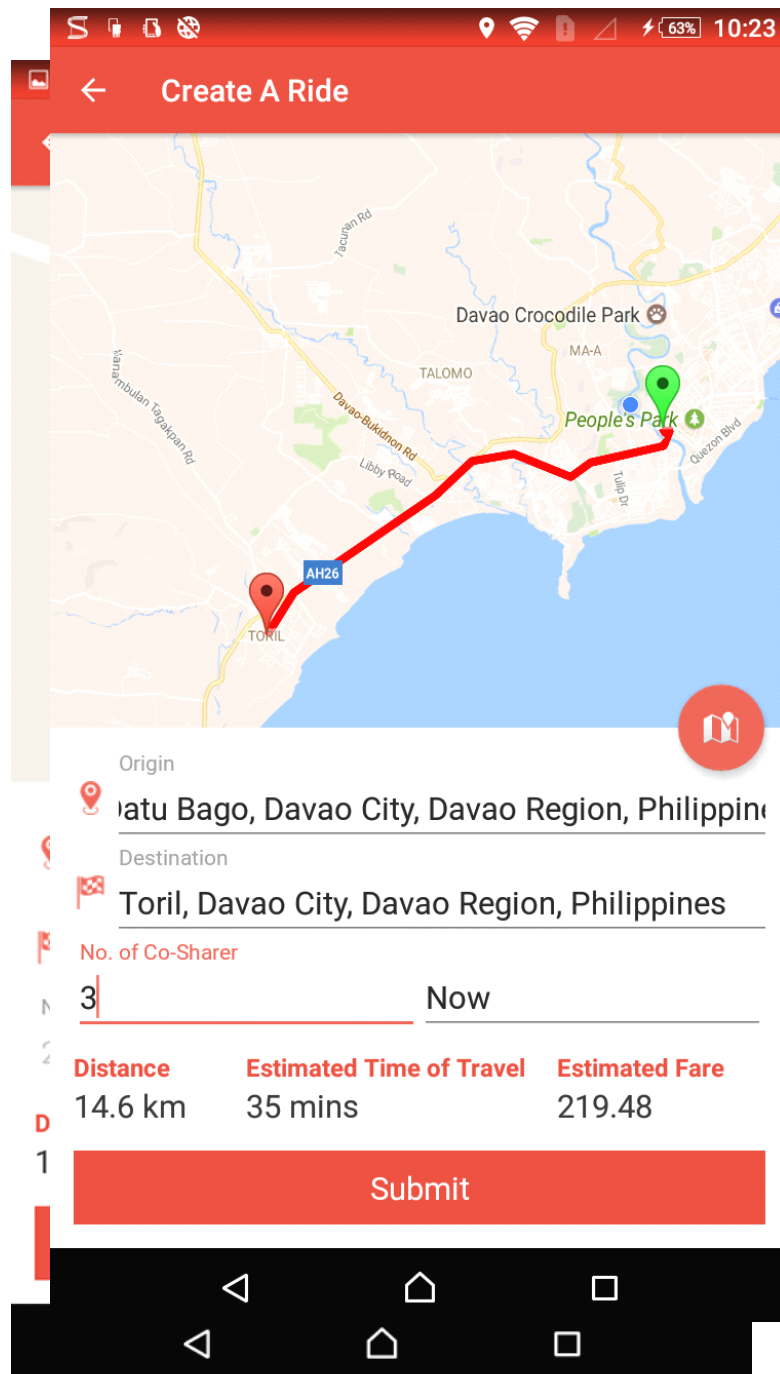
Figure 23 Create a Ride
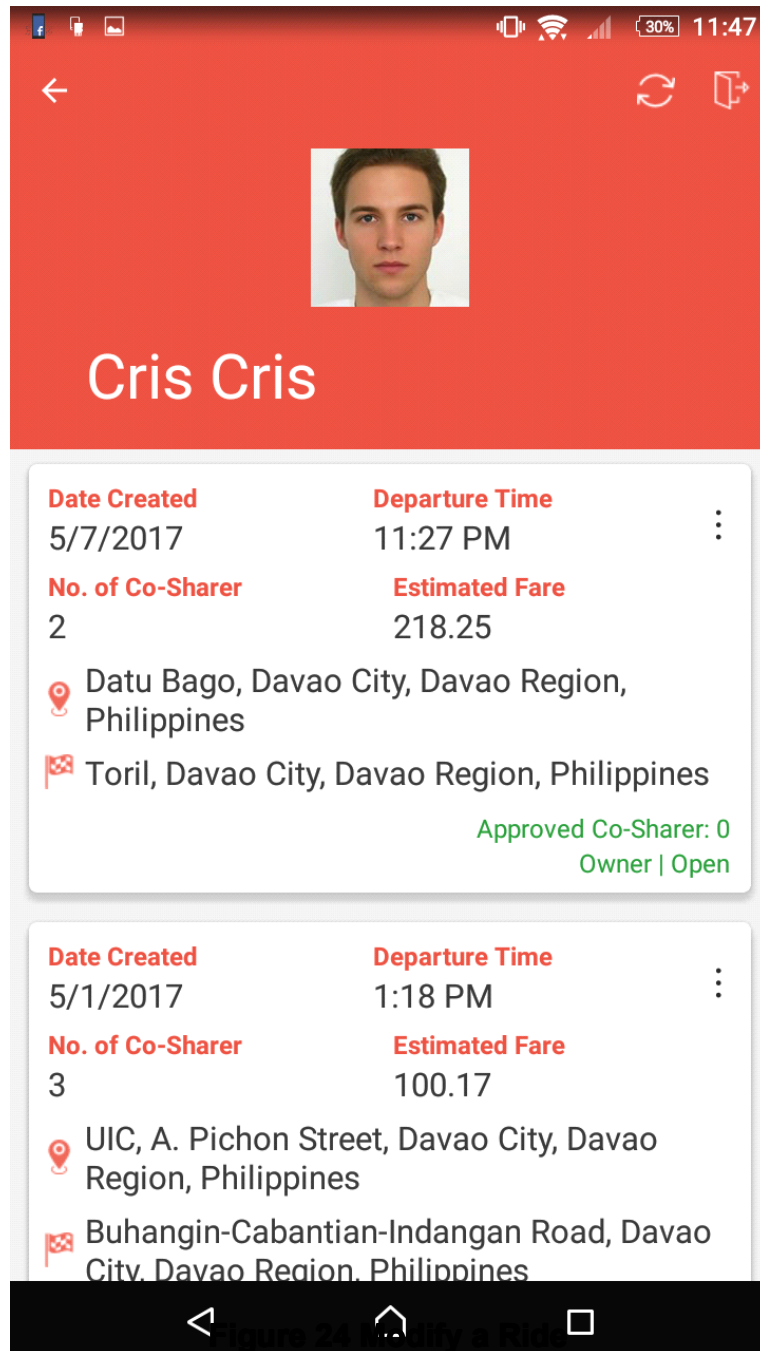
Figure 24 Modify a Ride
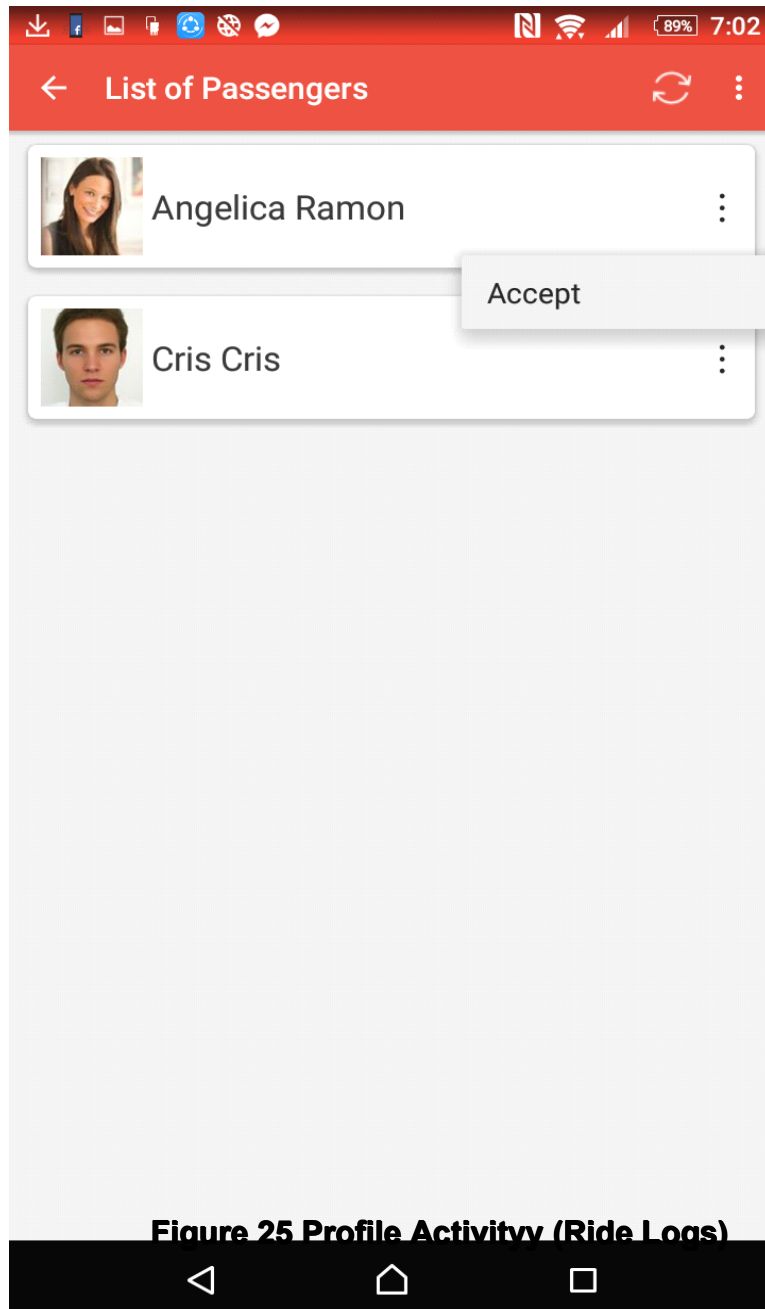
Figure 25 Profile Activityy (Ride Logs)

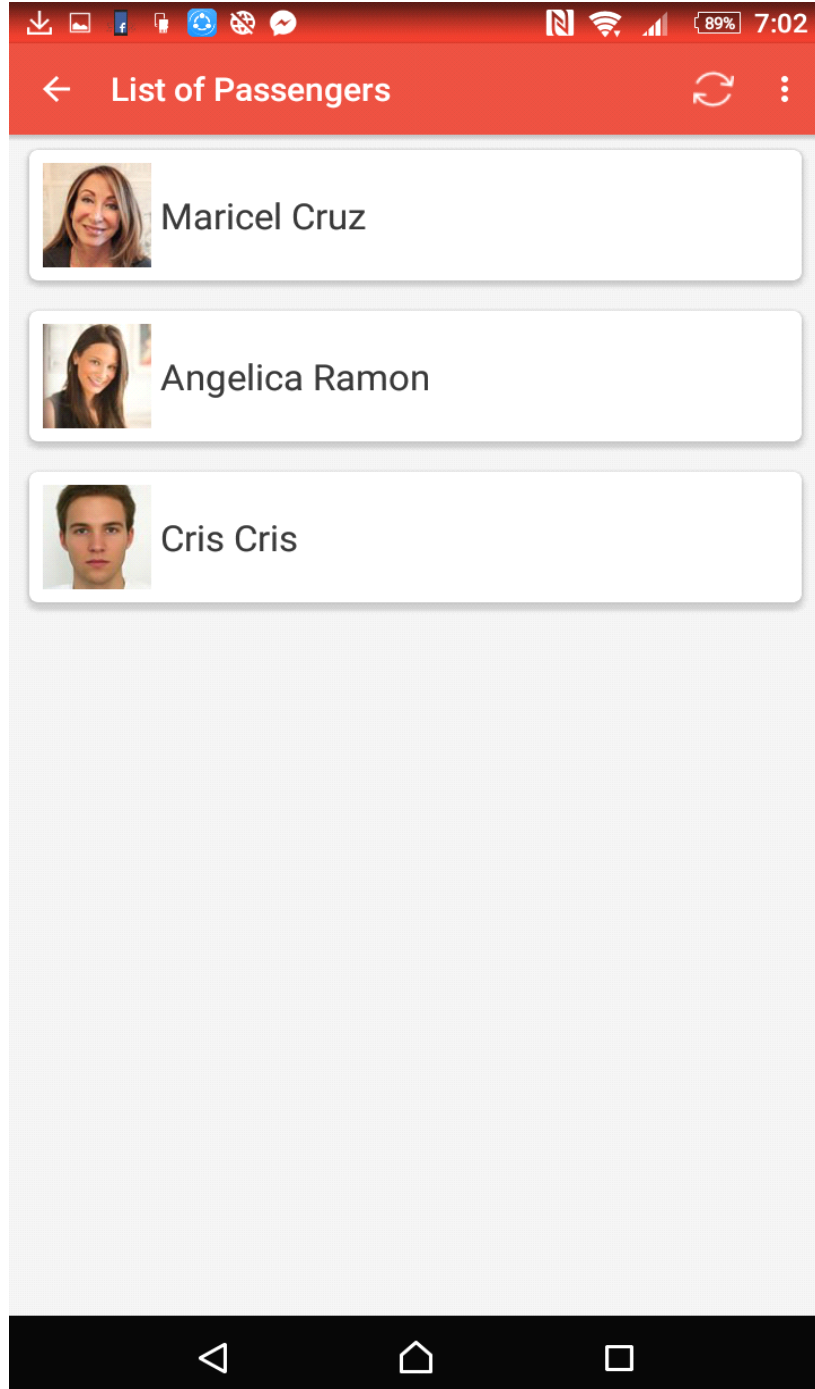**Figure 26 List of Passenger (Pending)**

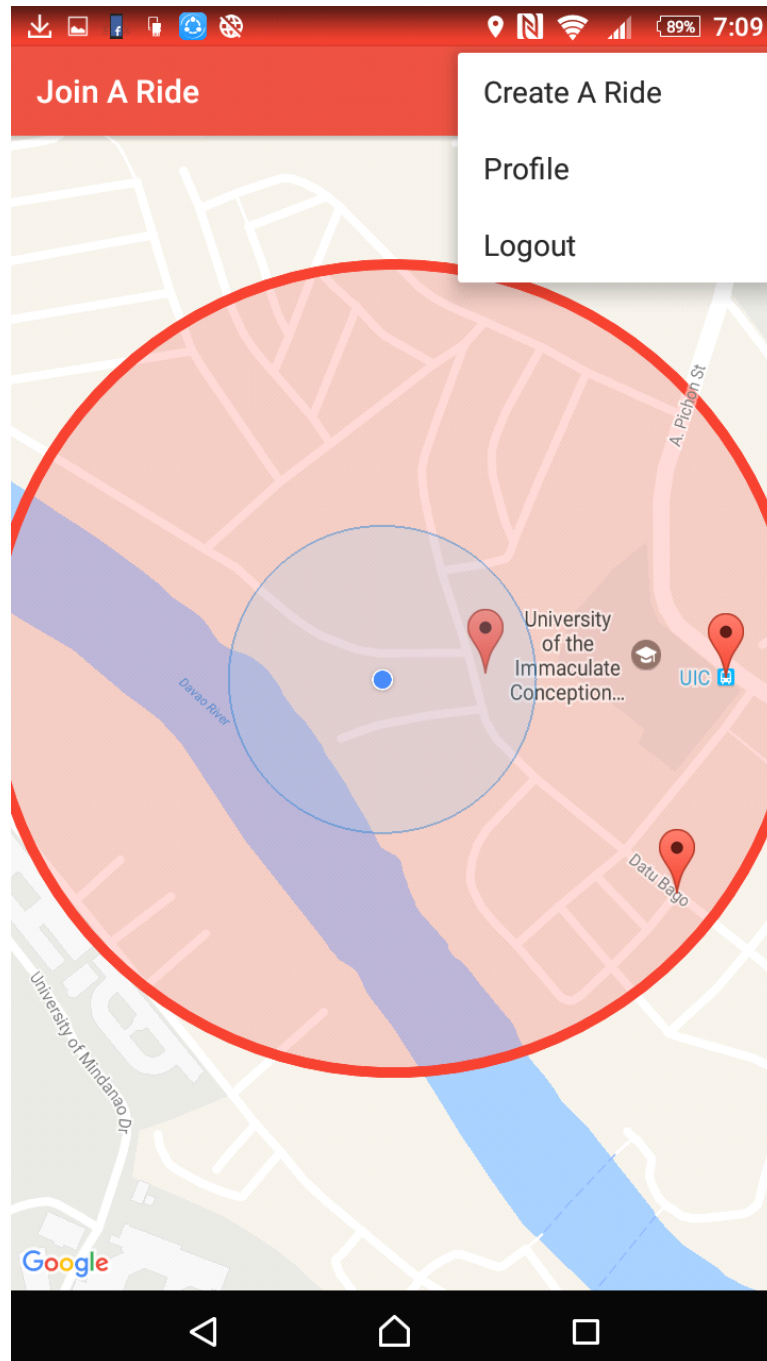**Figure 27 List of Passenger (Approved)**

Figure 28 Menu (Create a Ride, Profile and Logout)

Project Test Results

Test Results No: 1

Table 17 Test Case (Log in)

Test Case #1	Test Case Name : Log in				
Pre-Conditions: The user must the facebook account to log in to the system.					
Step	Action	Expected System	Pass	Fail	Comment
1	The user will open the mobile application	The system will display the log in activity.			
2	Click " Log in with facebook" button	1.The system navigate on join a ride screen if the user is regular use the system 2. If the user not log in on facebook account the system will navigate on facebook app to continue log in			
3	Click " Continue as (name of the user)" button.	If the user log in on facebook but the user first time use the system. The system ask to continue.The system will navigate the Join a ride screen and show the ride info.			
Post-Conditions: 2. The system initialize the facebook account of the user info to connect iShareAride.					

Test Results No: 2

Table 18 Test case (Join a ride)

Test Case #2		Test Case Name : Join a ride			
Pre-Conditions:					
The user joined a ride and the user can search desire destination					
Step	Action	Expected System	Pass	Fail	Comment
1	Click the "Search input" on the screen	The system allow user to input a keyword of the destination.			
2	Click the " Magnifier"	The system will show destination.			
3	Tap "location pin" on the screen.	The system will display the info window of user created a ride			
4	Tap the info window.	The system will navigate on full information of the user			
3	Click " Join" button	1. The system pop up message "You have successfully joined the ride" 2. If the user joining multiple ride. The system pop up a message "You cannot join another ride if you already joined to an existing ride that is open".			
	3. Tap "OK"	The pop message close			
Post-Condition:					
1. The user cannot join multiple ride 2. The user cannot create a ride if already join a ride.					

Test Results No: 3

Table 19 Test case (Create a ride)

Test Case #3 Test Case Name : Create a ride					
Pre-Conditions: The user create a ride					
Step	Action	Expected System	Pass	Fail	Comment
1	On Join a Ride screen tap the toolbar icon and tap to choose "Create a ride".	1. The system will navigate on create a ride screen. 2. If the user create another ride the system pop up a message "Unable Create another ride, please done your ride to able create a ride."			
2	Tap the Action button	The system will maximize the ride information fields			
3	Input text "origin" and "destination" on text fields.	The system will location then automatically the system will show the estimated distance, time and fare of travels.			
4	Long press the "Departure Time"(Now and Set Departure Time)	1. The system automatically set the present time 2. The system allow user to set departure time.			
5	Input text " No. of	The system allow 1-3 number to input			
6	Click "Submit" button.	The system will navigate on join a ride screen and the ride information will display on the screen.			
Post-Conditions: 1. The user unable to create a multiple ride 2. The ride travel must be done to able create a ride					

Test Results No: 4

Table 20 Test case (Profile)

Test Case #3 Test Case Name : Profile					
Pre-Conditions:					
The system will records the rides travels or the rides logs and the user can modify a ride					
Step	Action	Expected System	Pass	Fail	Comment
1	On the Join A Ride Screen tap the toolbar icon on join a ride screen and choose "Profile" in the menu.	The system will navigate on create Profile screen. The user can view ride logs			
2	On the ride log tap the toolbar icon choose on the menu tap "On ride"..	The system will pop up a message "You have successfully updated your ride status". If the users are already on the ride			
3	On the ride log tap the toolbar icon choose on the menu tap "Ride Complete".	The system will pop up a message "You have successfully updated your ride status". If the users are already done the ride			
4	Tap Ok	The pop up message will close			
5	On the ride logs click toolbar icon user choose "delete" in the menu.	The system allow user to delete ride logs after the ride is completed.			
Post-Conditions:					
1. The user can view their ride records 2. The user can delete the ride logs if the ride is already done 3. The user update status on ride and if the already done user can update the status ride complete.					

Test Results No: 5

Table 21 Test case (Modify A Ride)

Test Case #4 Test Case Name : Modify A Ride					
Pre-Conditions:					
The system will records the rides travels or the rides logs and the user can modify a ride					
Step	Action	Expected System	Pass	Fail	Comment
1	On the ride log tap the toolbar icon choose on the menu tap "Modify Ride".	The system navigates on Modify a Ride screen.			
2	On the Modify a Ride screen tap toolbar icon and tap to choose "Modify"	The system navigate on Modify A Ride Screen			
3	Input text "origin" and "destination" on text fields.	The system will display current location and desire destination of the user. Then automatically the system will show the Distance, Estimated time of travel and Estimated fare.			
4	Input text " No. of co-sharer" text fields	The system allow 1-3 number to input			
5	Click "Update" button.	1. The system pop a message "You have successfully updated your ride" 2. The system not allow to update if the departure is not set on present time or future time. The system pop up the message "Your departure time is in the past, Please change your departure time to present or future"			
6	Tap OK	The pop up message close.			
Post-Conditions:					
The user cannot update the ride if not set on present or future time					

Test Results No: 6

Table 22 Test Case (Logout)

Test Case #3 Test Case Name : Log out						
Pre-Conditions: The user can log out						
Step	Action	Expected System	Pass	Fail	Comment	
1	Tap the toolbar icon on join a ride screen and choose " Logout" in the menu.	The system will exit on the program				
2	On profile screen has a logout icon	The system will exit on the program				
Post-Condition **1. The logout activity is on the Join Ride Screen and the Profile Screen**						

Project Evaluation

Range	Descriptive Level	Interpretation
3.40 – 4.19	Strongly Agree	The specified feature function is highly acceptable to address the need or issue.
2.60 – 3.39	Agree	The specified feature function is acceptable to address the need or issue.
1.80 – 2.59	Disagree	The specified feature function is slightly unacceptable to address the need or issue.
1.00 – 1.79	Strongly Disagree	The specified feature function does not really address the need or issue.

Table 1 - Respondents' Evaluation on Communication on Split Fare

Indicators	$\bar{X}$	Description
1. The system displays users information.	3.77	Strongly Agree
2. The system displays the available ride.	3.72	Strongly Agree
3. The system has a join ride request to the user.	3.69	Strongly Agree
4. The system sends request the user who send a join a ride	3.65	Strongly Agree
5. The system shows the list of the user.	3.52	Strongly Agree
6. The system navigates the user location who created a ride.	3.60	Strongly Agree
Over-all $\bar{X}$	**3.66**	Strongly Agree

The respondents' evaluation on the indicators under communication on split fare is presented in table 1. The respondents were consistent in expressing their high affirmative evaluations. This means that the respondents strongly agreed that the system presented to them displays users information, the available ride and has a join ride request to the user, the system has a join ride request to the user. as evidenced by the computed mean scores of 3.77, 3.72 and 3.69, respectively. Consequently, they also strongly agreed that the system send a request to the user who send a join request, navigates the user location who created a ride and shows the list of the user, with the computed mean scores 3.65, 3.60 and 3.52, respectively. As a whole, the respondents strongly agreed that the features found in the are higly acceptable to address the pressing need in the absence of mean of communication wherein passengers could find someone that will share and negotiate taxi fare with the over-all mean score of 3.66. Hence the system presented to the respondents is a system that allows communication between passengers who are willing to split payment on taxi fare.

Table 2 - Respondents' Evaluation on Calculating Travel Rides

Indicators	$\overline{X}$	Description
1. The system gets the current location and user will input desire destination	3.71	Strongly Agree
2. The system calculates the estimated time travel	3.75	Strongly Agree
3. The system calculates the estimated fare	3.84	Strongly Agree
4. The system calculates the distance of travel	3.91	Strongly Agree
5. The system has set departure time for the user	3.89	Strongly Agree
Over-all $\overline{X}$	3.82	Strongly Agree

The respondents' evaluation on the indicators under communication on split fare is presented in table 1. The respondents were consistent in expressing their high affirmative evaluations. This means that the respondents strongly agreed that the system presented to the system gets the current location and user will input desire destination, the system calculates the estimated time travel, the system calculates the estimated fare as evidenced by the computed mean scores of 3.71, 3.75, and 3.84 respectively.

Consequently, they also strongly agreed that the system calculates the distance of travel, the system has set departure time for the user, with the computed mean scores 3.91, and 3.89, respectively. As a whole, the respondents strongly agreed that the features found in the are higly acceptable to address the pressing need in the absence of mean of the passenger cannot determine and estimate the travel from origin to destination with the over-all

mean score of 3.82. Hence the system presented to the respondents is a system that will calculate estimated ride travels.

Table 3 - Respondents' Evaluation on Viewing Shortest Path

Indicators	$\bar{X}$	Description
1. The system displays the shortest path for the user.	3.87	Strongly Agree

The respondents' evaluation on the indicators under communication on split fare is presented in Table 3. The respondents were consistent in expressing their high affirmative evaluations. This means that the respondents strongly agreed that the system presented to the system displays the shortest path for the user as evidenced by the computed mean scores of 3.87 respectively. As a whole, the respondents strongly agreed that the features found in the are highly acceptable to address the pressing need in the absence of mean the passenger are usually tricked with the route, the driver is driving through which will cause expensive fare with the over-all mean score of 3.87. Hence the system presented to the respondents is a system that can view routes shortest path from origin to destination.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the respondent's response, we the researchers concluded that:

1. The system truly provides an online avenue where users can communicate, hence minimize cost fare because they will meet personally to split fare.

2. Help passengers - Based on the survey results the researchers conducted, the user can know their ride travels which the calculation of time, distance and fare of the taxi.

3. Navigate the user information - The result of the survey concludes that the system really can determine the user profile.

Recommendations

For the future development of the system, The researchers recommend the following features and functions that may help the system to be more reliable and useful to its users.

1. Improve UI design - The system needs to be trendy, the UI design of the system should be updated yet user-friendly.

2. Rate the user – The user can rate each other after the ride. Base on what the user know or no doubt to share a ride if he/she is responsible of her/his action or trusted.

3. Notification – The system needs a notification if the user cancel, join, accept, modify a ride user can notify the actions.

4. Real Time Data – The system can automatically get the data which means there is no need for the system to refresh when displaying the updated data.

5. Social login – The system login will allow any social media login to continue using the app (Twitter or Gmail etc.)

6. Security - The system will be more secured

7. Path - The system needs a multiple path.

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