APPLICATION DEVELOPMENT RECOMENDATION SERVICING OF TWO-WHEELED VEHICLE SPECIAL TAXI ONLINE BASED ON TRAVEL HISTORY ON THE ANDROID PLATFORM

Tri Kuncoro Rahadyan[1] , Eko Budi Setiawan[2]

[1,2] Teknik Informatika – Universitas Komputer Indonesia
Jl. Dipatiukur 112-114 Bandung
E-mail : trikuncoro93@gmail.com[1], mail@ekobudisetiawan.com[2]

ABSTRAK

Online transportation is a public transport whose operation is online-based both for ordering and for payments. Online transportation has been widely used by the public. Online Transportation which is widely used by the public, namely Go-Jek and Grab. In running online transportation, Go-Jek and Grab already have hundreds of thousands of drivers. Almost every day the drivers do on bid between 8 to 12 hours. In practice, drivers, especially two-wheeled vehicles do not have consistent time in caring for their vehicles. Sometimes the driver forgets to take care of the vehicle. As a result, the drivers' vehicles can be damaged or not in prime condition while in use so there is a need for a system to overcome these problems using Google Map API technology. Google Map API is a programming function provided by Google Map so that Google maps can be integrated with the application being created. By using Google Map API technology the drivers can find out the total distance traveled while driving. So that drivers can have consistent time in caring for their vehicles so that the vehicle can be maintained in top condition during use.

Keywords: Online Transportation, Go-Jek, Grab, Driver, Google Map API.

1. INTRODUCTION

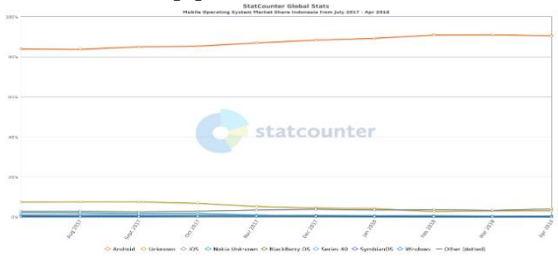
1. Background

Online transportation has been widely used in big cities in Indonesia. The most widely used online transportation includes Go-Jek and Grab. Go-Jek is a technology company in various informal sectors in Indonesia. Go-Jek has operated in 50 cities in Indonesia. Grab, previously known as GrabTaxi, is a Singaporean company that serves transportation and is available in six countries in Southeast Asia, namely Malaysia, Singapore, Thailand, Vietnam and Indonesia. Currently Grab has entered into various major cities in Indonesia [1]. Go-Jek first appeared in the city of Bandung on February 9, 2015 and Grab on February 1, 2017 [2].

Based on data obtained from questionnaires that have been distributed to online motorcycle taxi drivers in January 2018, it turns out that of the 30 responses that worked as online motorcycle taxi drivers Gojek 61.1%, Grab 38.9%. Those who use Honda brand vehicles are 61.1%, Yamaha 27.8% and Suzuki and Kawasaki respectively 5.6%. Which uses a motor type of 63.2%, automatic clutch 21.1% and manual clutch 15.8%. From these results, the Go-Jek driver is more than the Grab driver and the drivers use more Honda motorcycles with the matic type. Based on the results of the questionnaire as much as 50% were quite difficult to determine the service schedule, 35% had difficulty determining the service schedule and 15% had no difficulty determining the service schedule. Still based on the results of the questionnaire, as many as 47.6% had difficulty finding recommendations for parts damage to their vehicles, 38.1% were quite difficult and 14.3% had no difficulty in knowing the damage to auto parts.

Furthermore, based on the results of the questionnaire as much as 66.7%, it was difficult to find out what parts should be replaced, 19% was quite difficult and 14.3% had no difficulty in knowing what parts had to be replaced. From these results that the drivers are still having difficulty determining the schedule for servicing their vehicles because of their busyness on bid (the term narik or motorcycle taxi drivers among the online drivers) who average over 8 to 10 hours per day and online motorcycle taxi drivers have difficulty knowing of any damage and difficulty in knowing what parts must be replaced when damage occurs. That affects the continuity of drivers for on bid.

According to the analysis from StatCounter GlobalStats the number of Android users in Indonesia from July 2017 to April 2018 ranked first as many as 90.64%, iOS as much as 5.34% and Blackberry OS as much as 0.38% [3].



Source : http://gs.statcounter.com/

Figure 1. Statistics of Smartphone Users in Indonesia Based on OS

Based on the survey results of the Indonesian Internet Service Providers Association (APJII) in 2016 of the 256.2 million people in Indonesia, 132.7 million people have used the internet [4].

On Android smartphones there is a GPS that experienced a point shift compared to Garmin GPS of 10,494 meters and from this result Android-based GPS readings experienced a shift from the actual point of an average of 10, 494 meters. This means that when we are in a location, we must consider being approximately 11 meters from our location [5].

In the driver and passenger applications, the Go-Jek and Grab utilize LBS (Located Based Services) technology to display the position of the closest driver from the passenger when making an order and the GPS technology available on the smartphone and Google Map API to find out the location of the pick up point and point destination and can monitor drivers at the time of transfer location. This application also tells the time and distance that must be taken from the pickup point to the destination point [6].

In carrying out maintenance of two-wheeled vehicles, providers of two-wheeled vehicles such as Honda, Suzuki and Yamaha issued vehicle maintenance manuals based on distance or time of vehicle usage. Often the drivers do not pay attention to the use of the vehicle, especially the distance traveled while using the vehicle. Therefore, the solution is to help the drivers in caring for their vehicles such as service schedules and replacement parts using Google Map API to find out the total distance that has been taken while driving.

Berdasarkan uraian latar belakang maka diperlukan sebuah sistem untuk membantu mengatasi masalah yang sedang dihadapi. *Platform* yang digunakan adalah Android karena 90,64% masyarakat Indonesia adalah pengguna Android dan sebagian besar *driver* juga menggunakan Android. Maka dari itu, peneliti berkeinginan memanfaatkan Google Map API untuk mengetahui jarak tempuh *driver* selama berkendara.

2. Identification of problems

Based on the background described above, several problems can be identified including:

1. Online motorcycle drivers have difficulty determining the service schedule for their vehicles.
2. Online motorcycle taxi drivers find it difficult to know the recommendations for parts damage to their vehicles based on the journey taken.
3. Online motorcycle taxi drivers have difficulty knowing what parts should be replaced based on the journey taken.

3. Purpose and objectives

Based on the above problems, the purpose and objective of this research is to recommend the service of two-wheeled vehicles specifically for ojek drivers online and for the purposes of this research are:

1. Make it easy for online motorcycle taxi drivers to determine their vehicle service schedules.
2. Make it easy for online motorcycle taxi drivers to find recommendations for parts damage to their vehicles.
3. Make it easy for online motorcycle taxi drivers to know the recommendations for replacement parts.

1.4. Scope of problem

In this discussion, it is necessary to limit the problem which aims to identify which factors are included in the scope of the problem.

Some of the limitations of this problem are as follows:

1. Online motorcycle taxi drivers operating in Bandung City and Cimahi City.
2. Online motorcycle taxi drivers Gojek and Grab.
3. The system is made based on Android.
4. 4 stroke motorized vehicle.
5. For Honda, Yamaha and Suzuki motorcycle brands.
6. Service recommendations based on periodic maintenance schedules issued by the manufacturer of each motorbike brand.

1.5. Research methodology

The research method used in this writing uses descriptive analysis method which is a method that aims to get a clear picture of the things needed in research, through the following stages:

1.5.1. Method of collecting data

Data collection methods used in this study are as follows:

a. Field Study

Field studies are data collection carried out by conducting research at an event. Field studies conducted by observation and questionnaire

b. Study of literature

Collecting techniques by reading and researching the literature.

1.5.2. Software Development Method

In the construction of this application the method used is the waterfall model as the stage of software development. The process includes:

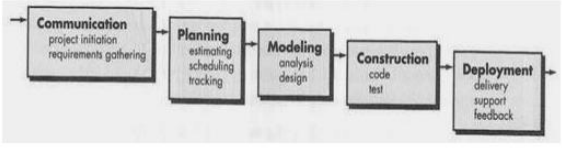


Figure 2. Waterfall Method

a. *Communication*

At this stage provide a questionnaire to system users, namely online motorcycle taxi drivers.

b. *Planning*

At this stage make and explain the tasks and schedule of activities to be carried out.

b. *Modeling*
At this stage it translates the requirements into a software design that can be estimated before the coding process.

c. *Construction*
This stage encodes and tests applications that have been made to ensure that the application has been made according to the needs of the users.

d. *Deployment*
This stage submits the application to the user and the system is made according to user needs.

2. ISI PENELITIAN

2.1 Driver

Drivers are professional drivers who are paid to drive motorized vehicles. In the implementation, drivers are divided into two, namely personal drivers, drivers who drive private vehicles and company drivers, drivers who work for transportation companies such as buses, taxis or freight transport [7].

2.2. LBS (Located Based Services)

LBS is an information service that can be accessed through a network and can display the geographical presence of the device. LBS functions to identify the location of a person or object, such as finding the location of the nearest mosque. Accessing LBS can be installed that moves like Android. Android is a mobile operating system that adopts the Linux operating system, but has been modified [8].

2.3. Google Map API

Google Map API is a service provided by Google to its users to use Google Map in developing applications. Google Map API provides several features to manipulate data and add context through various types of services that are owned and allows users to build enterprise applications on the web [9].

2.4. GPS

GPS is a navigation system using satellite tenology that can receive signals from satellites.

There are 5 steps in the workings of GPS, namely using the calculation of "triangulation", to calculate the "triangulation" GPS measures the distance using the travel time of radio signals, to measure GPS travel time requires high accuracy of time, must know with certainty the position of the satellite and must correct the delay signal travel time in the atmosphere [10].

2.5. System Analysis

System analysis aims to identify the problems contained in the system and determine the needs of the system being built. The analysis includes problem analysis, running system analysis, system architecture analysis, non functional needs analysis, functional needs analysis.

2.6. Problem analysis

Problem analysis is the stage of describing the problems that existed before this application was built and aims to assist in the construction of motorcycle service recommendation applications. The following is a description of the problems, including the following:

1. Online motorcycle drivers have difficulty determining the service schedule for their vehicles.
2. Online motorcycle taxi drivers have difficulty knowing the damage to their vehicle based on the journey taken.
3. Online motorcycle taxi drivers find it difficult to know what parts must be replaced based on the journey taken.

2.7. Current System Analysis

The current system among online motorcycle taxi drivers for vehicle maintenance is still based on the things that become the habit. Maintenance in this way is deemed ineffective and causes unexpected things to happen.

Most online motorcycle taxi drivers do their vehicle maintenance not in accordance with the procedures issued by the motor factory. Online motorcycle taxi drivers often take care of their vehicles in accordance with the things that are based on the habits of the online motorcycle taxi drivers. Habits - habits of online motorcycle taxi drivers in caring for their vehicles, namely:

1. Based on time
   In caring for the vehicle, some drivers are online motorcycle taxi based on the time of use of the vehicle, for example usage within 2 weeks or 1 month. This method is considered to be less effective because the use of online motorcycle taxi drivers can be said to be "tired" which on average per day usage is approximately 50 km - 150 km.
2. Based on usage
   In caring for the vehicle, some drivers of motorcycle taxi are based on their use, in the sense that when the vehicle feels uncomfortable or comfortable when used.
3. Based on feeling
   In caring for the vehicle, some drivers of motorcycle taxi are based on feeling, which only remembers the last time the vehicle was serviced.
4. Based on circumstances
   In caring for the vehicle, some online motorcycle taxi drivers are based on the existing conditions, for example online motorcycle drivers do service or replace their auto parts at the time of strike.

When an online motorbike diver does not routinely maintain the vehicle, online ojek drivers and their vehicles will experience things that happen unexpectedly, for example:

1. Motor crashes while in use
2. Sudden damage to spare parts

3. Financial expenses increase
4. Vehicles Can Not Be Used

2.8. Recommendation Analysis

The recommendation analysis aims to find out what recommendations are used in the system being built. Recommendations used are based on data from a table of periodic maintenance schedules issued or recommended based on each brand and type of motor factory. The following is one of the regular maintenance schedule tables, namely the Honda Vario 125 PGM FI motorbike.

Table 1. Honda Vario 125 PGM FI Maintenance Schedule

PERAWATAN

JADWAL PERAWATAN BERKALA

Lakukan Pemeriksaan Awal Sebelum Berkendara yang tertera pada Buku Pedoman Pemilik pada setiap jadwal perawatan berkala.

P: Periksa & Bersihkan, Setel, Lumasi atau Ganti jika diperlukan. B: Bersihkan. G: Ganti. L: Lumasi

Item - item perawatan berikut ini membutuhkan pengetahuan teknik. Beberapa item tertentu (khususnya yang diberi tanda * dan **) membutuhkan lebih banyak informasi tehnikal & peralatan khusus. Silahkan dikonsultasikan dengan AHASS terdekat.

	ITEM-ITEM	CATATAN	PREKUENSI (CATATAN 1) x 1000 km	1	4	8	12	16	20	24	28	32	36	40	44	48	52	PEMERIKSAAN TAHUNAN	LIHAT HALAMAN
*	SALURAN BAHAN BAKAR			P	P	P	P	P	P	P	P	P	P	P	P	P	P			3-4
**	SARINGAN BAHAN BAKAR			GANTI SETIAP 48.000 KM																3-4
*	CARA KERJA GAS TANGAN			P	P	P	P	P	P	P	P	P	P	P	P	P	P			3-5
*	SARINGAN UDARA	CATATAN 2						G				G				G				3-6
	PERNAPASAN BAK MESIN	CATATAN 3		B	B	B	B	B	B	B	B	B	B	B	B	B	B			3-7
	BUSI			P	G	P	G	P	G	P	G	P	G	P	G	P	G			3-7
*	JARAK RENGGANG VALVE			P	P	P	P	P	P	P	P	P	P	P	P	P	P			3-8
	OLI MESIN			G	G	G	G	G	G	G	G	G	G	G	G	G	G			3-10
*	SARINGAN KASA OLI MESIN					B		B		B		B		B		B				3-11
*	PUTARAN STASIONER MESIN			P	P	P	P	P	P	P	P	P	P	P	P	P	P			3-11
	CAIRAN PENDINGIN RADIATOR	CATATAN 4				P	G	P		G		P	G	P		G		2 TAHUN		3-12
*	SISTEM PENDINGINAN					P	P	P	P	P	P	P	P	P	P	P	P			3-12
*	DRIVE BELT					P		P		G		P		P		G				3-12
	OLI FINAL DRIVE (TRANSMISI)	CATATAN 4				G		G		G		G		G		G		2 TAHUN		3-13
	MINYAK REM	CATATAN 4			P	P	P	P	P	P	P	P	P	P	P	P	P	2 TAHUN		3-14
	KEAUSAN PADS REM				P	P	P	P	P	P	P	P	P	P	P	P	P			3-14
	SISTEM REM			P	P	P	P	P	P	P	P	P	P	P	P	P	P			3-15
	SWITCH LAMPU REM				P	P	P	P	P	P	P	P	P	P	P	P	P			3-17
**	KEAUSAN KANVAS KOPLING					P		P		P		P		P		P				3-18
	STANDAR SAMPING				P	P	P	P	P	P	P	P	P	P	P	P	P			3-18
*	SUSPENSI				P	P	P	P	P	P	P	P	P	P	P	P	P			3-18
*	MUR, BAUT, PENGIKAT			P		P		P		P		P		P		P				3-19
**	RODA/BAN				P	P	P	P	P	P	P	P	P	P	P	P	P			3-19
**	BEARING STEERING HEAD			P			P			P			P			P				3-20

* HANYA BOLEH DISERVIS OLEH AHASS, KECUALI APABILA PEMILIK MEMPUNYAI PERALATAN YANG TEPAT DAN DATA SERVIS YANG DIPERLUKAN DAN MEMILIKI KEMAMPUAN MEKANIK YANG CUKUP.

** DEMI KEPENTINGAN KEAMANAN, KAMI MENGANJURKAN AGAR PEKERJAAN-PEKERJAAN INI HANYA DIKERJAKAN OLEH AHASS

In the table above it is explained the periodic maintenance schedule issued by the Honda motor factory. There are many items - items, odometer readings and records for caring for Honda Beat FI motor vehicles, for example in the air filter item there is * which means it can only be serviced by AHASS unless the owner has special equipment. On the odometer reading there is a record of 1 whose contents at the odometer reading are higher, repeat at the frequency interval that has been done. Besides that, there is a letter G which is 16, meaning that every distance of 16000 km changes parts, so for the air filter items are replaced every distance has traveled 16000 km. Each item has a different letter, namely:

1. P = Check & Clean, Adjust, Lubricate or Replace if needed
2. B = Clean
3. G = Change
4. L = Lubricate

The maintenance process on Honda Beat FI vehicles when the odometer has shown 4000km, the engine oil is recommended to be replaced so that the vehicle remains prime when used.

2.9. Google Map API Analysis for Distance

In this study to get distance is using the Google Maps API. The following is an explanation of the Google Maps API analysis to get distance.

1. The system enters the initial location and destination location to the Google Maps API, with transportation mode.
2. The results of the process on the Google Maps API are in the form of JSON format. Where in the JSON format there is a status, duration, and distance element.

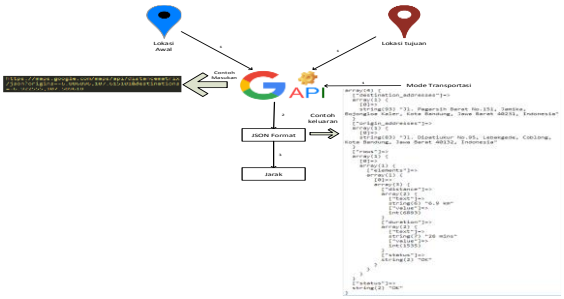


Figure 3. Google Map API Analysis for Distance

2.10. Architectural Analysis for Getting Distance

Architecture analysis of distance gain aims to identify the architecture to get distance to the system to be built. Architecture gets the distance can be seen in Figure 4 Architecture of Getting Distance.

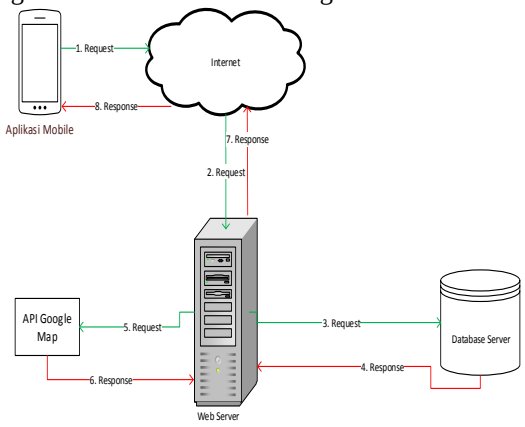


Figure 4. Distance Architecture

The following is a description of Figure 4. Architecture to Get Distance.

1. The user requests latitude and longitude data to the web server via the internet network.
2. The web server receives requests for latitude and longitude data from the user via the internet network.
3. The web server requests the latitude and longitude data to the database server.
4. The database server gives response to latitude and longitude data to the web server.
5. The web server requests distance data to the Google Map API.
6. The Google Map API provides response to distance data to the web server.
7. The web server gives a response to the distance data to the user via the internet network.
8. Users receive response distance data from the web server via the internet network.

2.11. Hardware Needs Analysis

Hardware requirements analysis is the decomposition of non functional requirements related to hardware specifications. Minimum specification table for Android hardware requirements to run

Android hardware can be seen in Table 2 Minimum Specifications for Android Hardware Requirements.

Table 2. Minimal Specifications for Android Hardware Requirements

Type	Spesification
RAM	1 GB
Memory	4 GB
Operation System	Android 4.4 KitKat

2.12. Analysis of Software Requirements

Software requirements analysis is the decomposition of non-functional requirements related to software specifications. The minimum specification table of software requirements for running software used to create applications can be seen in Table 3. Software Requirements Specifications.

Table 3. Software Requirements Specifications

Type	Spesification
Computer Operating System	Microsoft Windows 7 ultimate
Android Operating System	5.0 Lolipop
Web Server	XAMPP 5.6.8
Browser	Google Chrome
Integrated Development Environment (IDE)	Android Studio
Text Editor	Sublime Text 3

2.13. User Analysis

User system analysis is intended to find out who are the users involved in running the system, so that the level and understanding of users can be known.

Tabel 4. User Analysis

N.o	User	Characteristics
1	Driver	a. Can operate a smartphone b. Have experience using the internet

2.14. Class Diagram

The class diagram on this service recommendation application can be seen in Figure 5. Class Diagram.

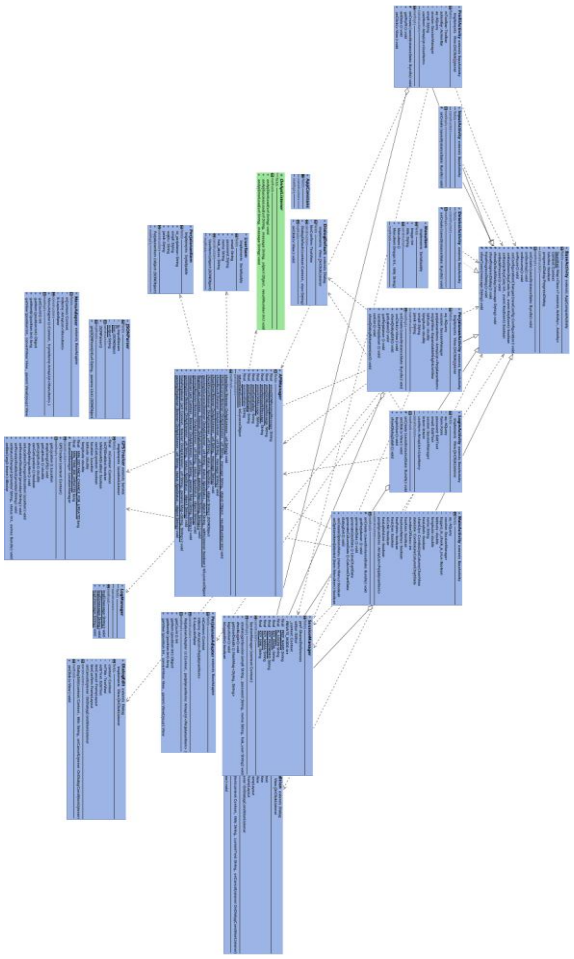


Figure 5. Class Diagram

2.15. Menu Structure Design

Menu structure design is an explanation to facilitate the application operation. The tool in making the menu structure is Microsoft Visio 2013. The design of the menu structure can be seen in Figure 6 Design of the Menu Structure of the Mobile Application..

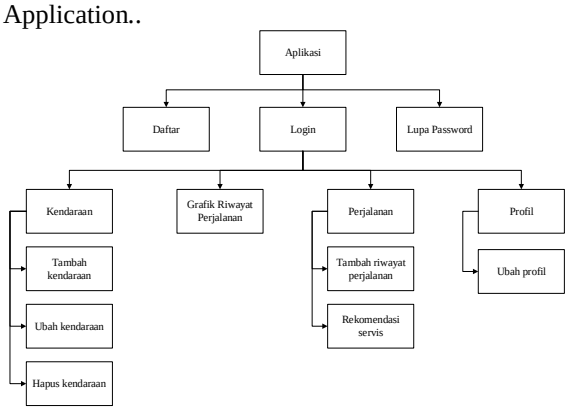


Figure 6. Menu Structure Design of Mobile Applications

2.16. System Implementation and Testing

The system implementation stage is the design translation stage based on the results of analysis into a particular programming language and the application of software built in the real environment.

2.17. Alpha Testing

Alpha testing is done using a black-box method that focuses on the functional requirements of the software.

Testing this program using the black-box method. Black-box testing is a program testing based on the functional of the program. The purpose of this black-box method is to find malfunctions in the program. Black-box testing is done by giving a number of input data to the application which is then processed according to its functional requirements to see if the application is then processed according to its functional requirements to see whether the application produces the output that is used and in accordance with the function of the program. If from the input data that is given the process of producing an output that matches its functional needs, then the application that has been made is correct. But if the output produced is not in accordance with its functional requirements, there are still errors in the application program.

Based on the results of the alpha testing that has been carried out in its entirety it can be concluded that the process in this system is functionally usable and produces the expected output.

2.18. Beta Testing

Beta testing is an objective test conducted directly by users who will later use this Service Recommendation Application, among others are online motorcycle taxi drivers. This research was conducted using a questionnaire technique. This is done in order to find out how far the application built can help and solve the problems that have been explained in the identification of problems.

This beta test is done by conducting a direct test at the research site using a questionnaire. Questions submitted on the questionnaire to users who will use the system.

3. CLOSING

3.1. Conclucions

Based on the results of the tests and discussions that have been made, the following conclusions can be drawn:

1. By using the distance the driver can find out the service schedule, recommendations for parts damage and parts replacement recommendations.

2. This application can simplify the driver in determining the service schedule to take care of the vehicle ..

3.2. Suggestion

Suggestions that can be given to the development of the system that has been made for further system development are:

1. This application is expected in the future to be able to work together with the official workshop of each motorcycle brand.
2. Android applications are expected to provide more detailed information.

DAFTAR PUSTAKA

[1] I. Farnita, "Layanan Mobile Ho-Jak, Go-Jek dan Grab Terhadap Perbandingan Pengalaman Pengguna (Studi Pada Konsumen PT. Ho-Jak Indonesia, PT.Aplikasi Anak Bangsa dan PT.GRAB Indonesia di Kota Banda Aceh)," *Jurnal Ekonomi dan Manajemen Teknologi (EMT)*, vol. 1, pp. 97 - 106, 2017.

[2] M. Fachrurrozy and I. Rachmawati, "Analisis Kualitas Pelayanan Pada Gojek Bandung," in *e-Proceeding of Management*, Bandung, 2017.

[3] S. GlobalStat, "gs.statcounter.com/os-market-share/mobile/indonesia," July - Aprl 2017 - 2018. [Online]. Available: http://gs.statcounter.com.

[4] K. Wulandari, "Pengaruh Kencanduan Internet Dan Materialisme Terhadap Perilaku Pembelian Kompulsif Online," *E-Jurnal Manajemen Unud*, vol. 7, pp. 1021 - 1049, 2018.

[5] A. F. Oklilas, S. D. Siswanti and M. D. Rachman, "Akurasi Pembacaan GPS Pada Android Untuk Location Based Service (Studi Kasus: Informasi Lokasi SMA di Palembang)," *Jurnal Ilmu Komputer Agri-Informatika*, vol. 4, pp. 1 - 5, 2015.

[6] B. R. Hidayat and H. Februariyanti, "Aplikasi Location Based Service (LBS) Pencarian Lokasi Taxi Pada Android Di Kota Semarang," *Dinamika Informatika*, vol. 5, pp. 16 - 25, 2013.

[7] S. Surahman and E. B. Setiawan, "Aplikasi Mobile Driver Online Berbasis," *ULTIMA InfoSys*, vol. VIII, pp. 35 - 42, 2017.

[8] G. R. P. Dirgantara, S. and B. Rahayudi, "Implementasi Metode Certainty Factor pada Identifikasi Kerusakan Kendaraan Bermotor Roda Dua," *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*, vol. 2, pp. 2046 - 2050, 2018.

[9] E. K. Ariwibowo, "Pemanfaatan Smartphone Semaksimal Mungkin: Digitalisasi Produk Kebahasaan Ke Dalam Aplikasi Sebagai Solusi Mitigasi Pergeseran Bahasa Jawa," *Magistra*, vol. 27, pp. 21 - 28, 2015.

[10] E. Rahayu and M. I. P. Nasution, "Implementasi Object Oriented Programming Dalam Aplikasi Penggajian Guru," in *Konferensi Nasional Pengembangan Teknologi Informasi dan Komunikasi*, Medan, 2014.