LAUNDRY SERVICE APPLICATION DEVELOPMENT ANDROID BASED

Christine Primawaty1, Sufa'atin2

1.2Informatic Engineering - University Computer Indonesia
1.2Jl. Dipatiukur 112-116, Lebakgede, Coblong, Bandung, West Java 40132
E-mail: primawatychristine@gmail.com1, sufaatin@email.unikom.ac.id2

ABSTRACT

laundry OXY Laundry service providers is growing in the city of Bandung and has develop some branches of business in some regions Bandung (Dipatiukur, Cikutra, Kopo, Soekarno-Hatta and Suryasumantri). On the other hand, many Android smartphone users use the preferred community. Thus, conducted research to design Android-based applications laundry services are more effective and provide efficiency of time to process laundry pickup, records of incoming and outgoing garments, and provide information on their own laundry OXY. The method used includes literature review, interviews, questionnaires, design and testing. The technology used in the making of this application is the PDF417 SDK to perform customer thegarments sanning on the label, and the Google Maps to see where the nearest laundry, Geofencing to calculate the shortest distance laundry from customers and the latter Push Notification to provide process or status messages that are in the laundry clothing. The technology used, it produced an application where customers easily request an jeput laundry, washing stage status tracking and search on Laundry latest information. And for the laundry business as well with this application helps to log the clothes out. Pursuant to the results of interviews, questionnaires and black box testing, the application made enough help for entrepreneurs laundry and laundry customers.
Keywords : Laundry, Android, SDK PDF417, Geofencing, Push Notification, black box testing.

1.   PRELIMINARY

Relative research that I took on laundry services-based application development android. I analyzed the study entitled development application shuttle Web-based laundry service on android platform, that laundry business sebaai running in the services business was considered to be more convenient to incorporate the android smartphone technology and the information therein.
 Based on this, came the idea to create a shuttle laundry applications used by delivery courier and laundry pick for menfata clothing mask and record new customers in a timely manner to be delivered to admin. In the making This application is expected dapoat help run laundry business in efficient and provide better convenience to the courier to transact with customers as well as for admins to perform data processing. Laundry go round a kind of effort in the field washing and ironing services. [1]

Seeing the entrepreneurs thinking of creating service provision latanan or laundry which is basically a routine activity of human in daily changing clothes are used, and are not always able to conduct washing clothes because a limited time, place (for drying clothes) and the ability of each individual. Seeing a picture of the situation of one of the developers laundry service is one that is OXY Laundry. OXY Laundry is laundry services provider that develops in the region Bandung (Dpatiukur, Cikutra, Kopo, Soekarno-Hatta and Suryasumantri). Laundry OXY want the maximum service to the consumer.

related perkenbangan internet as a new medium, consumption community towards smartphones is also increasing the number of internet users in the world increased significantly greeting recent years due to the presence of the mobile intenet technology. Android who has been a society that because the price is relatively cheap. And none requires the possibility of propagating jiga laundry kedunia namely laundry OXY already memkau android smartphone and from the results of 40 questionnaires was declared memkai society smartphone android.

Additionally OXY laundry see some of the constraints experienced by consumers of laundry (the translation berijut questionnaire results OXY laundry of some 40 consumer laundry) and conclude that there are some drawbacks to optimize service laundry services some of which are: the difficulty consumers DSLAM find the location of OXY laundry that terjangkao, limitations consumers in mebawa clothes laundry OXY localized, limited information about price and time details prosed laundering, because remembering many cases the consumer is often the case where consumers are experiencing a loss] han laundry physical memorandum that includes information about the price and the amount of

clothing Her laundry was so not worth efficient for consumers and frequent occurrence consumer apparel 3 to 4 consumers in a week lost due to the occurrence of consumer clothing mixed up with other consumers.

From the explanation above resulted laundry OXY missed a consumer choose other options. Adapaun alibat experienced by consumers inefficiencies in terms of time and limited information OXY mngenai laundry services. Therefore needed an application that could facilitate the laundry.

2. LITERATURE REVIEW

2.1. Android

Android is an operating sustem for Linux-based mobile devices that includes a middleware operating siostem and applications. Android provides an open platform for developers to create their application. Initially, gogle Inc. buy Android Inc. which is a new pendatanag who make software for mobile smartphones. then to develop Android, formed the Open *Handset Alliance,* consortium of 35 companies for hardware, software, and telecommunications, including Google, HTC, Intel, Motorola, Qualcomm, T-Mubile, and Nvidia. [3]

2.2. GPS (Global Positioning System)

GPS adlah stands for Global Positioning Sysstem, yng a system navigation by using technology simyal satellites that can receive satellite. This cleverly uses 26 satellites Yag send a signal micro glombang earth. This signal was diterina by the receiver at the beginning, where GPS RECEVER receive infronasi of GPS satellites. [12]

1. time. GPS receiver receiving information from an atomic clock time ynag have accuracy is very high.
2. Location. GPS give Opera- location.
3. Speed. When on the move, the GPS can show the moving speed information.
4. Direction of travel. GPS can show arrah goal.
5. Save location. Places you've been or want visited bias stored by the GPS receiver
6. Komulasi data. RECEVER GPS can keep track Opera-, like traveling yng already done, kecepstan average, the slowest speed, time / h to a destination, and sebagainnya. [12]

3. Research methodology

The methodology is a process that is used too late solve a logical problem, which requires data to support the implementation of a study. The methodology used mainly dalaamm desriptif combined research degan quantitative approach. The research method is a method that bertujaun deskripstif provide systematically gabaran of the research object.
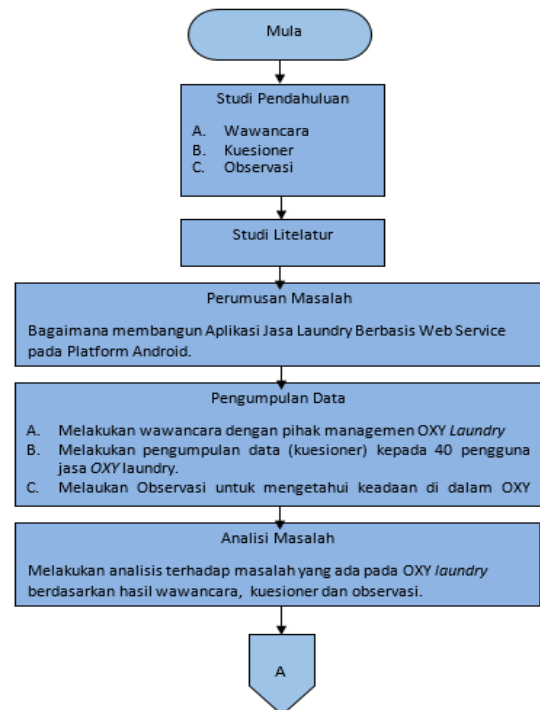
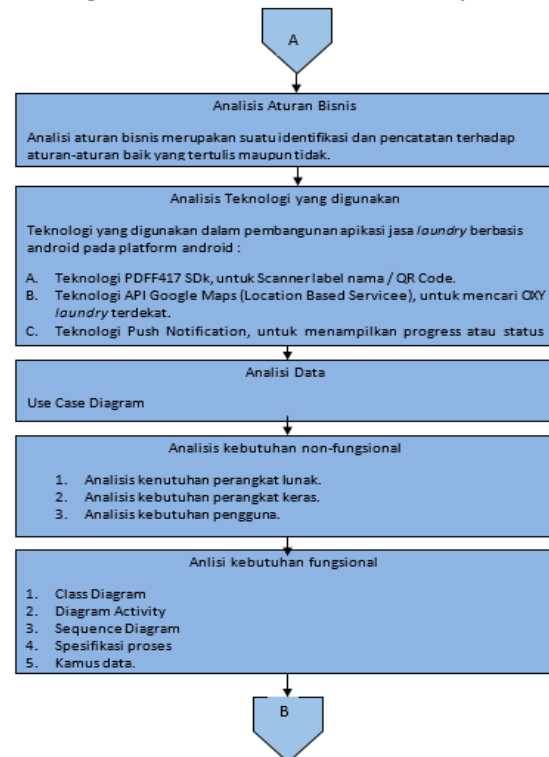

Figure 3.1 Flowchart OXY Laundry Methods

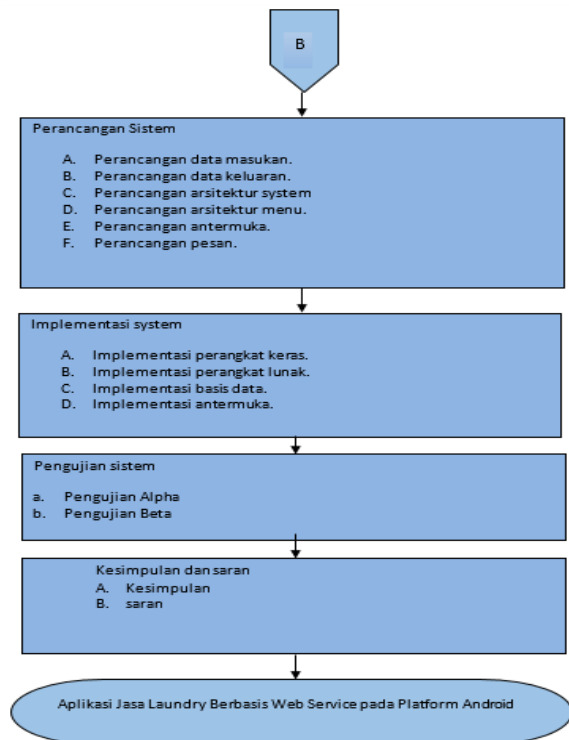**Figure 3.1 Flowchart OXY Laundry Methods**

Figure 3.3 Flowchart OXY Laundry Methods

3.1. Method of collecting data

The method of collecting the data obtained directly from the object of research. Data collection stages, namely:

1. questionnaires
   the questionnaire Laundry is done to consumers and ask him things about laundry OXY.
2. Interview
   Interviews were conducted in laundry OXY with the management of the laundry.
3. Observation
   The observations were made to determine the state of the environment in the laundry OXY.

3.2. Software Development Methods

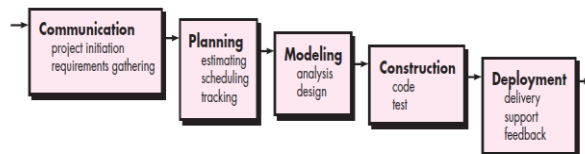The method used in the software using the waterfall model Pressman as the phases of software development.

Figure 3.4 Waterfall Model Pressman
Source: Pressman, Roger S. [2]

1. *Communication*
   Needs analysis software, and a stage to hold a meeting gathering degan DTA with the customer, as well as data-gathering additional dat whether there is journalized, articles, and internet.
2. *Planning*
   Planning process is a continuation of the communication process (analysis requirement). This will generate a document Tahpan user requirement or bias said as the data related to user keinginana dalsm software development, including renana will do.
3. *modeling*
   The modeling process will translate terms perancagan kesebuah needs Stunt diperkiakan software before it is made coding. This process focuses on the design of data structures, software architecture, intergace representation, and detail (algorithm) procedural. This stage will produce a document called a software requirement.
4. *contruction*
   Contruction is the process of making the code. Coding or coding is a translation in a
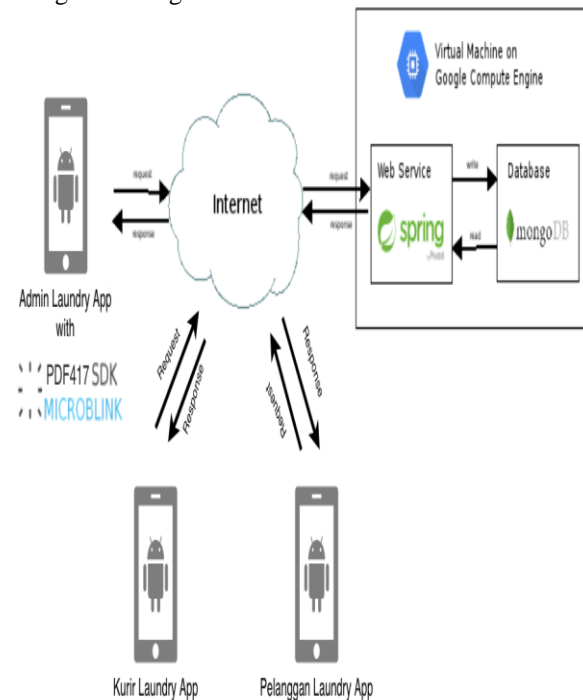
language bias desaun recognized by the computer. programmers willtranslating the transaction requested by the user. stages scientific a real stage in the development of working on a software, meaning that users koputer be maximized in this stage. After the coding is completed makaa diloakukan testing of the system has been made TDI. The purpose of testing

is find the mistakes The system terhdap then the bias corrected.

5. *deployment*

   stages This bias the final say in making a piece of software or system. After analysis, the coding dessain and then the system already so akian dihunakan by the user. Kemudaiin software that has been created must performed maintenance periodically. [2]

4. RESULTS AND DISCUSSION

In this stage consists of a general overview of the system, analysis and design of the system to be described in bump system architecture, technology implementation. Terakhi step is to do the testing so dpat conclusion.

4.1. Architectural Design System

Architecture analysis aims to identify the system architecture to be built. Here adaah Architecture pembnagunan system used in this application.

The image above shows arsitketur systems used in the development of this application. Here's an explanation from the image above:

1. Applications Ordering System OYX with PDF417 Barcode scanning of Microblink. The steps already described in the previous section.
2. For other functional associated with the data and transactions, applications do http request to a web service for each functional run.
3. Web services built using the Spring Framework. With the Java programming language support. Web service receives the request and send a response with JSON format.
4. Web service communicates with the database to read and write data. database
5. which is used to store all the data used is MongoDB.
6. Webservice and deploy databases to Google Cloud Virtual Machine in Plstform. Google Cloud service platforms used are Google Compute Engine.
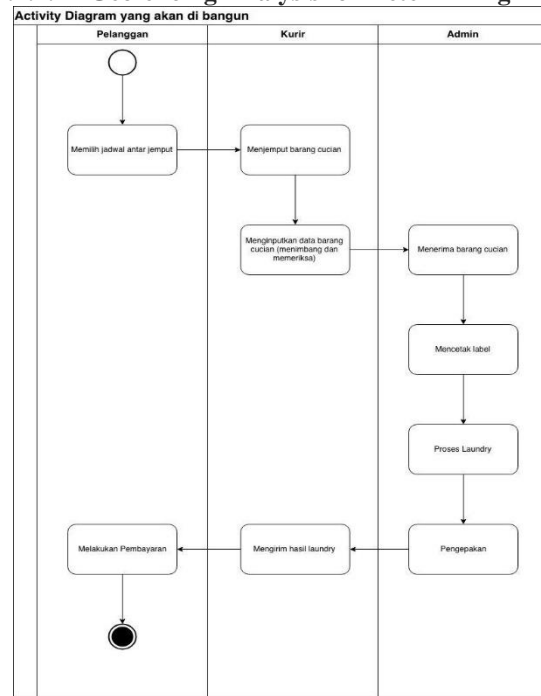
4.2. Analysis System To Be In Build

Here is a system that is running on OXY Laundry:

4.3. analysis Technology

Analysis technology is used to determine the process flow of a technology that is used and applied

kedlam application to be built. This application development using an application that can support end users.

4.2.1. Geofencing Analysis for Determining

Courier

Geofence is a barrier that can be applied to monitor the movement of an object in a certain area, so when GPS detects an object that was monitored over the limit, then the system will provide notification to the observers.

Thus the selection process for the courier Geifencing method is used with the work: the calculations are done using a formula haversine to know the distance between the two locations. Then the results of these calculations will be sorted from smallest to largest distance, the system will then choose the smallest distance to handle The customer ordering ..

Figure 4.2 Activity Diagram Procedures OXY Laundry Service

Any user making a reservation, the system will determine which branch to the incoming orders, seen from geofencing radius and distance of the nearest yag. For example, a user who book is on site latitude and longitude 107.681356 -6.913590. When the existing branches are as follows:

Table 4.1 Examples Latitude and Longitude OXY Laundry

Branch	Latitude	Longitude
Branch OXY 1	-6.91403	107.68107
Branch OXY 2	-6.91228	107.68005
Branch OXY 3	-6.922426	107.670202

Next will be the calculation of the distance between the pickup location tighty using Formula Haversime. Formula Havrsine method menghiutng distance between two points with bedasarkan lururs two points on the line of longitude and latitude.

The following forms Haversine formula Formula:

```
Δlat = lat2-lat1
Δlong = long2-long1
a = sin (Δlat / 2) 2 + cos (rad lat1) * cos (rad
lat2) + sin (Δlong / 2) 2
c = 2 salted (a)
d = R * c
Information :
R = radius of the earth by 6371 (km)
Δlat = amount of changes in latitude
Δlong = amount of changes in longitude
c = calculation axes intersect
d = distance (km)
1 degree = 0.0174532925 rad
```

The above calculation is done to all existing users, then the result will be like the table below.

Table 4.2 Results Calculation Formula Branch Haversine OXY Laundry

user	Latitude	Longitude	Distance
Branch OXY 1	-6.91403	107.68107	0.058 km
Branch OXY 2	-6.91228	107.68005	0.205 km
Branch OXY 3	-6.922426	107.67022	1,577 km

If tolerance is a maximum distance of 500 m, which will go to the geofencing radius is the branch 1

and branch 2. The next closest is taken, so the elected branches 1.

By using this Geofencing can memeberikan convenience for consumers looking for a courier OXY OXY laundry in the laundry nearby.

4.2.2 Analysis Scanning PDF417 SDK

analysis PDF417 scanning a picture process flow of scanning activity label goods, on the scan using the SDK PDF417 developed by Microblink. PDF417 SDK able to do PDF417 code scanning so applications can read the information.

4.4. Software Requirements Specification

Spesififkasi software needs divided kedlam namely two non fungsoanl needs and kbeutuhan functional.

1.3.1 Software Requirements Analysis

analysis software requirements is uaraian needs of non-functional associated with the development of this application. The software used is as follows:

Table 4.3 Software Requirements

No.	Software Requirements
1	Operating Systems Windows 10 Home
2	Integrated development environment (IDE) Android Studio 3.2.1
3	Java Runtime Environment (JRE) 1.8.
4	Java Development Kit 1.8.
5	Android SDK API 21 (version 5.1 Lollipop)
6	Android Development Tools 25.2.2
7	NetBean IDE 8.2
8	Java
9	MongoDB
10	web Browser

1.3.2 Hardware Requirements Analysis

The hardware required based on the needs that must be met other anatar:

1. Backend hardware
   On the backend application in the form of Application Program Interface, applications run on a Cloud Computing from the Google Cloud Platform with hardware requirements specification as follows:

Table 4.4 Hardware Requirements

No.	Hardware Requirement
1	RAM 4 GB
2	500 GB hard drive
3	CPU: Intel Core 2 N3350

4.5. Functional Needs Analysis

Use case is recording engineering functional requirements a system. Use case mendeskripsiskan advance of the user interaction with the system.

4.4.1 Description Actor

Explaining anyone actors involved in the application. Can be seen in the following table:

Table 4.5 Description Actor

4.6. Class Diagram

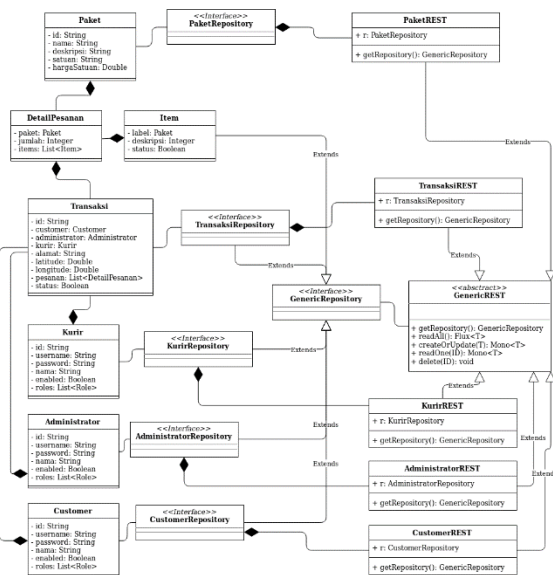Class diagram describing the types of objects in the system a wide range of static relationships.

Figure 4.3 Class Diagram
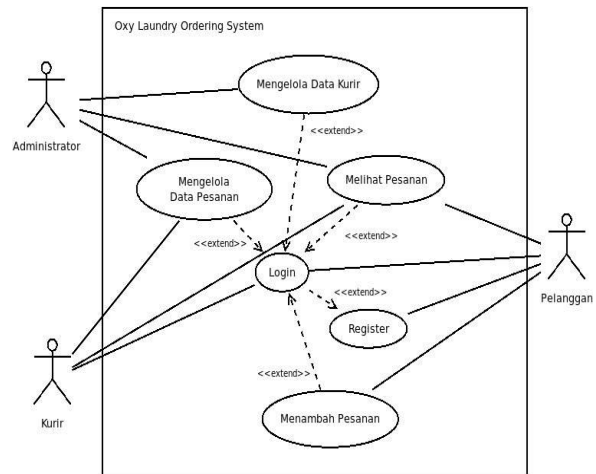

Figure 4.2 Use Case Diagram

No.	Actor	Description
1	Admin	An actor who will do the laundry managing data, managing data courier, view orders, manage orders data, login
2	Courier	An actor who will see order data ..
3	Customer	An actor who will do the registration, add orders, view order.

4.7. Design Data Enter OXY Laundry

describes the design of the data enter enter data required in the system.
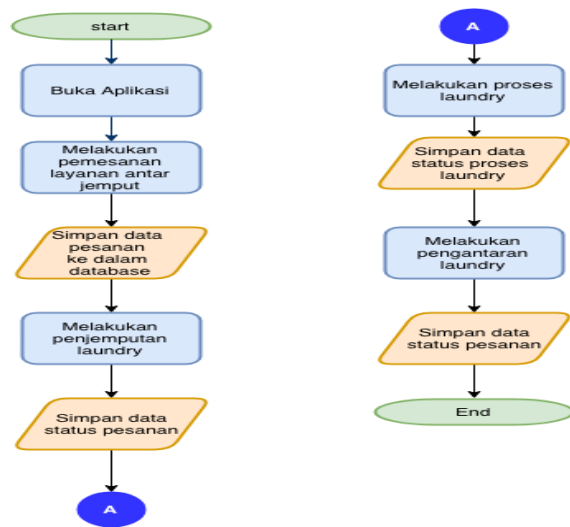

Figure 4.4 Flowchart Data Input System

4.8. implementation interface

Implementation of the attached system interface, while for the login interface implementation.
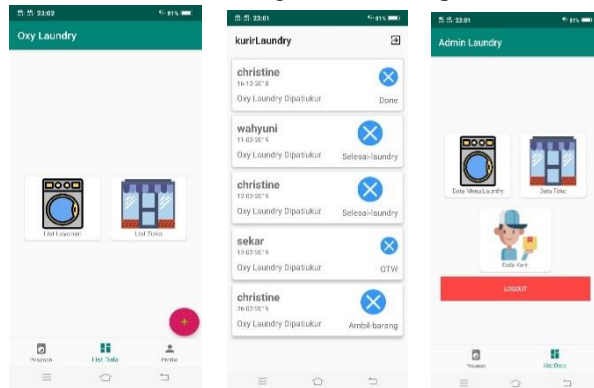

Figure 4.5 Interface login OXY Laundry Applications

4.9. testing Systems

System testing conducted to determine whether the system has been built in accordance denfan desired work.

Table 4.5 Results of Questionnaire Answers

First question: Does this application help in the process of doing laundry shuttle?				
SS	S	C	TS	STS
17	0	0	0	0
Average - Average = ((85 + 0 + 0 + 0 + 0) / 85)) x100 = 100%				
The second question: Does this application can help in the process pncarian laundry OXY closest to the customer?				
SS	S	C	TS	STS
9	5	3	0	0
Average - Average = ((45 + 20 + 9 + 0 + 0) / 85) / 100 = 87%				
Third question: Does the app helpful in providing information in laundry OXY?				
SS	S	C	TS	STS
15	1	1	0	0
Average - Average = ((75 + 4 + 3 + 0-0) / 85) x100 = 96%				
The four questions: Does this application help you in monitoring the clothes in the laundry?				
SS	S	C	TS	STS
7	8	2	0	0
Average - Average = ((35 + 32 + 6 + 0 + 0) / 85) x100 = 85%				
Average - Average End = (100% + 87% + 96% + 85%) / 4 = 92%				

5. CONCLUSION

After a test, then obtained some useful conclusions are expected for the development of further applications.

5.1 Conclusion

Based on the results of research and testing conducted, then be obtained conclusion that, applications can assist in the search OXY laundry nearest customer premises, applications can assist in the shuttle Taitu, so consumers so much easier to do laundry, Applications can be helpful in providing information (price, type of service, laundry branch) OXY laundry and can assist in monitoring applications or provide the status of being in the laundry clothing.

5.2 Suggestion

In the process of user testing still feel the bias is enhanced in applications that have been built. The suggestions for the development of the application is in laundry OXY must not give information in detail, to see developed further order data, application development can be done on smartphones other than Android.

BIBLIOGRAPHY

[1] Suprayogi, DA, and WF Mahmudy, Application of Genetic The algorithm Traveling Salesman Problem With Time Window: A Case Study of These Laundry Pick ", Buana inform, Vol.6, PD. 121-130, 2014.

[2] Pressman, RS, Software Engineering: a practitioner's approach, McGraw- Hill, New York, 2010.

[3] Nazruddin Safaat H, Application Programming Mobile Smartphone and Tablet PC Android Based second revision, Informatics Bandung: May, 2015.

[4] Roki Aditama, WEB SERVICE Tuition Online Payments with PHP and SOAP WSDL CV Lokomedia, 2017.

[5] Siti Syamsiah, Know HTML Programming, Information Technology, 2016.

[6] Feridi, RSTful Know Web Service, Code Politan, 2016.

[7] Munawar, Object-Oriented Analysis System Design With UML (Unified Modeling Language), Bandung: Bandung Informatics, 2018.

[8] Lee, D., Designing the push framework for mobile multimedia applications, International Journal of Advanced Science and Technology, 32, pp.117-124, 2014.

[9] Arif Ravindra, Android-Based Application Smart Laundry, Batam: Informatics, 2013.

[10] Andi Juansyah, "Child TrackerBerbasis Application Development Assisted Global Positioning System (A-GPS) with the Android platform," Journal of Scientific Computing and Informatics (KOMPUTA), vol. 1, no. ISSN, p. 8, August 2015.

[11] Abdul Kadir, HTNL5, Dewiberta Hardjono, Ed.: ANDI Yogyakarta, 2013.

[12] Copyright, Hendra, and Rangga Guntara degree. "Online Booking Software Development Barbershop Bandung Using Mobile Technology In Global Positioning System And Web Services On the Android platform." (2017).

[13] L. Williams, "Testing Overview and Black-Box Testing Techniques" 2006, pp. 34-35.

[14] Roly Segara and Subari, Kids Area Monitoring Systems Method Using Geofencing On the Android platform, Journal Infromatika, Malang: The Malang STIKI Vol.8 June 1, 2017.