DESIGN AND DEVELOPMENT OF MASACAKE APPLICATION TO RECOMMENDATIONS AND ONLINE ORDER OF THE CAKE IN BAGUS SHOP USING YOUTUBE API

Refah Istifahani Handoko[1], Dian Dharmayanti[2]

[1,2]Teknik Informatika - Universitas Komputer Indonesia
Jl. Dipatiukur 112-114 Bandung
Email : rerefahanihan@gmail.com[1] , dian.dharmayanti@email.unikom.ac.id[2]

ABSTRAK

Toko Bagus is a line of business that is engaged in the sale of baking ingredients and tools related to making cakes. The activities in making cake is no longer as special activities, because it has been as a hobby for particular person even not only woman but man also involved in activities of making cake. In making cake, the recipe become standards start from materials and procedure. However, to buy some material sometimes a little more effort, willing to line up and crammed to get it with other people. Moreover, occurred anxiety in buy cake's material especially about the prices. Sometimes the consumer hard to decide cost estimate because in certain period, the prices will be change frequently until become anxiety in buy cake's material. To dissolve the problems it will create "Design and Development of Masacake Application to Recommendations and Online Order Of The Cake In Bagus's Shop Using YouTube API".

Kata kunci : Recommendations, Online Order, YouTube API

INTRODUCTION

Toko Bagus is a line of business that is engaged in the sale of baking ingredients and tools related to making cakes. Toko Bagus itself is located in Indramayu Regency, more precisely in the western part of Indramayu. Nowadays technology is getting more sophisticated, internet access is getting easier and cheaper, most people shop their daily needs online or browse the internet. In making cakes, recipes become a benchmark starting from the ingredients and how to process them, but in buying an ingredient sometimes to get it with a little more effort and must be willing to queue up and jostle with others. In addition, sometimes there is a concern in buying cake ingredients, especially in terms of price because sometimes consumers have difficulty in determining the estimated cost because in a certain period of time the price often turns into a concern in buying cake ingredients.
Difficulties in making cakes are not just in terms of ingredients, but the processing method becomes difficult especially for those of us those who want to just learn to load a cake because the recipe and method of processing cakes are only in the form of text that sometimes needs to read several times the steps that must be passed that cause failure in making cakes. With the many recipes that recipe, someone needs input or recommendations to determine which cake recipe to choose. A recommendation will certainly come from other people who have done or tried it.

There is a technology in mobile applications, Youtube. Youtube is used to see the cooking tutorial, YouTube is a website that facilitates users to share videos or just enjoy various videos [1].

From previous research on the Slope One algorithm, the advantage of the Slop One algorithm compared to other recommendation algorithms is that the slop one algorithm is easy to implement, efficient when performing queries, does not do many requiretments because recommendations are based on the rating of each item and are quite accurate [2].

Based on these problems, an Android-based application was created to help consumers determine the cake ingredients needed and help to make purchases and get tutorials on how to make cakes. Therefore, this research will focus on building the application entitled
"Design and Development of Masacake Application to Rekomendations and Online Order Of The Cake In Bagus's Shop Using Youtube API ".

1.1. Identification Of Problems

Based on the problems that have been described above, the problems can be identified as follows:

1. Consumers have difficulty determining what cake ingredients are needed and estimated purchase costs for making types of cakes.
2. Consumers have difficulty buying to the store directly.

3. Consumers have difficulty finding tutorials on how to make cakes according to the available ingredients

1.2. Purpose and Objective

The intent and purpose of this research is to build an application for recommendations and online ordering of cake ingredients at Toko Bagus. While the objectives of this study are:

1. Help consumers determine the cake ingredients needed to make cakes and calculate estimated costs to be incurred.
2. Helping consumers make purchases of cake ingredients without having to come to a good store location.
3. Help consumers get tutorials on how to make cakes according to the available ingredients

1. RESEARCH CONTENTS

2.1. Application

An application is software that is run by users to get a specific purpose. Software application is a subclass of computer software that utilizes the ability of the computer directly to perform a task desired by the user. Software applications are programs that make computers workable for daily work. Software applications are the programs most used by users on computers. Usually compared to system software that integrates a variety of computer capabilities but does not directly apply that ability to do a task that benefits the user, the software application interacts and can be used directly by the user. Software applications, or simply applications, are often called 'productivity programs' or 'end-user programs' because they enable users to complete tasks such as creating documents, spreadsheets, databases, and publications, doing online research, sending emails, creating graphics, running a business, and even playing games. Special software applications for assignments are designed for and can be as simple calculator applications or as complex as word processing applications [3].

2.2. *E-Commerce*

E-Commerce is a term that is often used or heard on the internet, where no one knows the meaning of e-commers clearly. Here is the definition of e-commerce according to experts:

1. McLeod Pearson (2008: 59) Electronic commerce or e-commerce, is the use of communication and computer networks to carry out business processes. A popular view of e-commerce is the use of the internet and computers with Web browsers to buy and sell products.
2. Menurut Sherly Cashman (2007 : 83) E-Commerce or short for electronic commerce (trading electronically), such as the internet. Anyone who can access a computer, has connections to the internet, and has a way to pay for the goods or services they buy, can participate in e-commerce.
3. Menurut Jony Wong (2010 : 33) The definition of electronic commerce is the buying, selling and marketing of goods and services through an electronic system. Such as radio, television and computer networks or the internet.

So the notion of E-Commerce is the process of buying and selling transactions carried out through the internet where the website is used as a container to carry out the process [4].

2.3. Collaborative Filtering

Collaborative filtering is an algorithm used to develop a recommender system and has been shown to provide excellent results. Product rating is the most important element of this algorithm, rating is obtained from most customers where the customer explicitly gives an assessment of the product. . The conclusion is the system provides reciprocity to customers by processing these data, as a picture of a scale of zero to 5 which indicates the most undesirable ratings to the most preferred according to the customer's point of view, this data makes it possible to do statistical calculations whose results indicate which products given a high rating by the customer [5].

2.4. Slope One

Slope One Algorithm Slope One Algorithm is the easiest form of rating based Collaborative Filtering technique. This simplicity makes this algorithm easy to implement with a level of accuracy that is not inferior to algorithms with calculations that are far more difficult. This algorithm was finally used as a basis for the development of several algorithms.

The Slope One algorithm performs calculations based on a linear relationship of the preference value or weight of each item being compared. General estimation from the basic calculation of the Slope One algorithm is a linear function $y = mx + b$, assuming the gradient $m = 1$, so the function becomes $b = y - x$. The workings of the Slope One algorithm is to find the difference between an item and other items being compared [2].

The Slope One algorithm calculation can be formulated with equation (1) to find the difference..... (1)

$$dev_{j,i} = \sum_{u \epsilon S_{j,i}(x)} \frac{u_j - u_i}{card\left(S_{j,i}(x)\right)}$$

Where :

$dev_{j,i}$ = average difference in rating of items j and i
u_j = *item rating j*
u_i = *item rating i*
card ($S_{j,i}(x)$) = many elements to compare.

If the difference is obtained, then the recommendation can be calculated for item j which can be formulated by equation (2):

$$p^{SI}(u)_j = dev_{j,i} + u_j \quad .....(2)$$

Where :

$p^{SI}(u)_j$ = Recommended value for item j

Based on the above equation, the Slope One algorithm provides recommendations by calculating the difference in each item. The difference obtained will be averaged per item which will then be added to the value of each item. Values that have been added to the average difference will be used as a point to provide recommendations.

2.5. API (Application Programming Interface)

Application Programming Interface (API) is a software interface that consists of a collection of instructions stored in the form of a library and explains how a software can interact with other software. This explanation can be exemplified by analogy if a house will be built. By hiring a contractor who can handle different parts, the homeowner can provide the tasks that need to be done by the contractor without having to know how the contractor completes the work. From the analogy, the house is the software that will be made, and the contractor is an API that works on certain parts of the software without having to know how to do the job.

2.6. *Youtube API*

The Youtube API is a collection of functions provided by Youtube developers to enable Youtube video content and functionality to be integrated into websites, software applications or other devices. With the API data, you can add various YouTube features to the application. Use the API to upload videos, manage playlists and subscriptions, update channel settings and much more. [6].

2.7. Android

Android is an operating system for Linux-based mobile devices that includes an operating system, middleware and applications. Android provides an open platform for developers to create their applications. Initially, Google Inc. buy Android Inc. which is a newcomer who makes software for cellphones / smartphones. Then to develop Android, the Open Handset Alliance was formed, a consorium of 34 hardware, software and telecommunications companies, including Google, HTC, Intel, Motorola, Qualcomm, T-Mobile, and Nvidia [7].

2.8. MySQL

MySql is a SQL database management system software, also known as DBMS (Database Management System). SQL is a database operation concept, especially for the selection or selection and entry of data, which allows easy operation of data automatically [8].

2.9. Java

Java is a programming language that can be run anywhere and on any platform in a variety of environments: internet, intranet, consumer electronic products, and computer applications [9].

2.10. Modeling

The analysis is a breakdown aimed to identify the problems found in the system and determine the needs of the system being built. At this system analysis stage there is an analysis in it including problem analysis, analysis of the system being built, analysis of the technology used, analysis of non-functional requirements, and functional needs.

1. Mobile

The mobile platform is an application for mobility using equipment such as PDAs, cell phones. By doing various kinds of activities ranging from entertainment, selling, learning, and so forth [10].

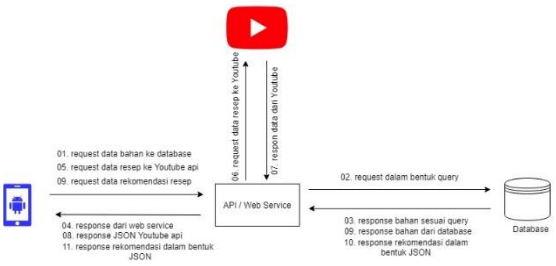

Image 1 Analysis System That Will Be Built On Mobile

The following is a description of the Architectural drawings that will be built:Perangkat mobile pengguna melakukan request data bahan ke database

melalui penghubung yaitu sebuah Web Service yang terdapat di server

1. Web Services that have received material data requests from users then make requests in the form of query commands to get data from the database.
2. Web Service gets material data from the database in accordance with the query made, then Web Service makes the data structure in the form of JSON.
3. The system contained in the mobile device users get material data responses from the Web Service in JSON format then a parsing process is performed.
4. User's mobile devices make video data requests to Youtube through a link that is a Web Service that is in the server.Web Service melakukan request data resep ke Youtube untuk mendapatkan resep
5. Web Service gets recipe data from Youtube then Web Service makes the data structure in the form of JSON.
6. The system contained in the mobile users got a response from Youtube Web Service data in JSON format then the parsing process was carried out.
7. The system contained in the mobile device users request recipe recommendation data
8. Web Service requests data to Youtube to get a video tutorial.
9. Web Service gets recipe recommendation request from database then Web Service makes the data structure in the form of JSON.
10. The system contained in the mobile users got response recommendations in JSON format then a parsing process was carried out.

2.11. Slope One

Slope One algorithm is one algorithm that can be used to predict an event. The example discussed this time is about determining the rating of an item based on existing data. This algorithm was eventually used as a basis for the development of several other algorithms.

The first step is to calculate the average difference between recipes based on the rating data from consumers in table 3.1 using Equation 1. The following is an example of calculating the average difference between recipes.

$$dev_{j,i} = \sum u \in S_{j,i}(x) \frac{uj-ui}{card(S_{j,i}(x))} \text{ ..... (3)}$$

u is Ratna, Arum, Siska
uj = rating for recipe B
ui = rating for recipe D
card(Sj,i(x)) = the number of consumers who rated item i and item j is 3 people

Before doing the calculation, it is assumed there are 6 types of recipes that have been indexed before, which can be seen as in Table 5

Table 1 Rating of Six Types of Recipes

Tabel *5* Nama resep	Nama indexs
Membuat pancake mudah	A
Resep Membuat pancake	B
Membuat pancake jepang	C
Membuat pancake durian	D
Membuat pancake milo	E
Membuat pancake	F

Table 2 Rating Scenarios

Tabel 6 Konsumen	Rating Resep Kue					
	A	B	C	D	E	F
Ratna	-	**5**	**4**	**3**	-	-
Bella	-	-	**3**	**2**	**4**	**1**
Sinta	-	**3**	-	-	-	**3**
Desi	**4**	-	-	**1**	-	-
Arum	-	**2**	**2**	**4**	-	**5**
Siska	**?**	**5**	**?**	**4**	**?**	**?**

The average value difference between recipe B and recipe D is

$$\frac{5-3}{3} + \frac{2-4}{3} + \frac{5-4}{3} = 0{,}67 - 0{,}67 + 0.333 = 0.333$$

Table 3 shows the values between the rating differences between recipes based on the rating values given by consumers. The value in table 2 shows the greater the value in absolute means the difference in rating between users is increasingly different.

Table 3 The average value difference between cake recipes

Resep Kue	A	B	C	D	E	F
A	0	0	0	-3	0	0
B	0	0	-0.5	-0.33	0	1.5
C	0	0.5	0	0	1	0.5
D	3	0.33	0	0	2	0
E	0	0	-1	-2	0	-3
F	0	-1.4	-0.5	0	3	0

The next step is to calculate predictions based on the average data in table 3.2 and table 3.3 using equation 4.

$$P(u)_j = \frac{1}{card(R_j)} \sum_{i \in R_j} (dev_{j,i} + u_i) \ldots.(4)$$

The predictive value that will be sought is the predictive value of cookie recipes that will be recommended to Siska consumers, namely the predictive value of recipe A, recipe C, recipe E and F. So that from this predication value can be made recommendations for siska consumers.

The predictive value of recipe A, assisted by Desi consumers, who have rated Recipe D.

P(A) = 1/1*(3+4) = 7

The prediction value of recipe C, assisted by consumers Ratna and Arum, who have rated recipes B and D. Bella customers who have given recipe rating D.

P(C) = 1/5 * ((-0.5+4) + (0+4) + (-0.5+2) + (0+2) + (0+3)) = 1/5 * 14 = 2,8

The predicted value of recipe E, assisted by Bella consumers, who have given a recipe rating of D

P(E) = 1/1 * (2+4) = 6

The predictive value of recipe F, assisted by Arum customers, who have given a recipe rating B and D. Sinta consumers who have given a recipe rating B. Bella customers who have given a recipe rating D.

P(F) = 1/4 * ((1.5+5)+(0+5)+(1.5+3)+(0+2))

= 1/4 * 18

= 4,5

Table 4 shows the predicted values of recipes A, C, E, F for Siska consumers.

Table 4 A, C, E, F recipe predictions for Siska consumers

Tabel 8 Resep Kue	Nilai Prediksi
A	7
C	2,8
E	6
F	4,5

From the predicted values in tabl 3. We can make a recipe recommendation sequence for Siska customers, namely:

1. Recipe A
2. Recipe E
3. Recipe F
4. Recipe C

2.12. Rekommendation Based On Promo's

Recipe Recommendation Case Study Based on Promo Items, this case study will present examples of recommendations for getting recipes based on ingredients from the list of promo items in the store. For example, suppose the following is a list of items that are being promoed at a store.

Table 5 Material Name

No.	Nama Bahan	Harga
1	Keju Mozarella	40.000
2	Margarine	10.000
3	Coklat Bar	25.000
4	Susu Full Cream	20.000

Then the system will take some sample recipes from the Youtube API.

Table 6 Example Recipe

No.	Nama Resep	Bahan
1	Brownis Kukus Keju Mozarella	Keju Mozarella, tepung terigu, telur, susu, margarin, coklat, gula pasir
2	Bolu Pisang	Buah pisang, tepung terigu, gula pasir, telur, margarin, susu bubuk
3	Choco Lava	Coklat, telur, margarin, terigu, susu
4	Strawberry Cake	Buah strawberry, gula pasir, terigu, telur, susu full cream, whipcream bubuk
5	Bolu Tape Mozarella	Keju mozzarella, santan kelapa, tepung terigu, tape, gula pasir, margarin

Based on the ingredients being promoed above, the system will provide any recipe recommendations that contain ingredients from the promo item. Recommendations will be filtered from recipes that contain the most promotional ingredients to recipes that contain the least promotional material.

This recommendation is useful for people who want to make cakes from ingredients at low prices because they are promising and they are no longer troubled in finding recipes that match the ingredients that are being promoted.

The following results are the comparison between recipes with promo ingredients and the same amount of ingredients and the amount of residual ingredients that are not the same.

Table 7 Comparison Results

No.	Nama Resep	Bahan yang Sama	Jumlah yang Sama	Sisa Bahan
1	Brownis Kukus	Mozarella, margarin, coklat, susu	4	3

	Keju Mozarella			
2	Bolu Pisang	Margarin	1	5
3	Choco Lava	Coklat, margarin, susu	3	2
4	Strawberry Cake	Susu	1	5
5	Bolu Tape Mozarella	Mozarella, margarin	2	4

Formula to find the percentage of material match = (same amount / sum of all ingredients) * 100%. The calculation results are in the following table.

Table 8 The calculation results

No.	Nama Resep	Jumlah yang Sama	Jumlah Semua Bahan	Persentase Kecocokan
1	Brownis Kukus Keju Mozarella	4	7	57%
2	Bolu Pisang	1	6	16%
3	Choco Lava	3	5	60%
4	Strawberry Cake	1	6	16%
5	Bolu Tape Mozarella	2	6	33%

Then based on the results of the calculation, a recommendation for the order of recipes based on ingredients that best matches the promo items in the store is obtained as follows.

Table 9 Calculation Results Recommendation

No.	Nama Resep	Persentase Kecocokan
1	Choco Lava	60%
2	Brownis Kukus Keju Mozarella	57%
3	Bolu Tape Mozarella	33%
4	Bolu Pisang	16%
5	Strawberry Cake	16%

2.13. Use Case Diagram

Use Case Diagrams provide a way to describe the external view of the system's interactions with the outside world. Here is a diagram of the use case application that will *be built.*

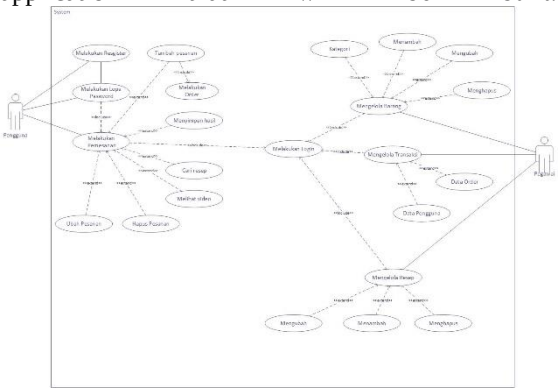

Image 2 Use Case Diagram

2.14. Interface Implementation

1. Mobile Interface

The following is the display interface that was built:

1. Login Interface

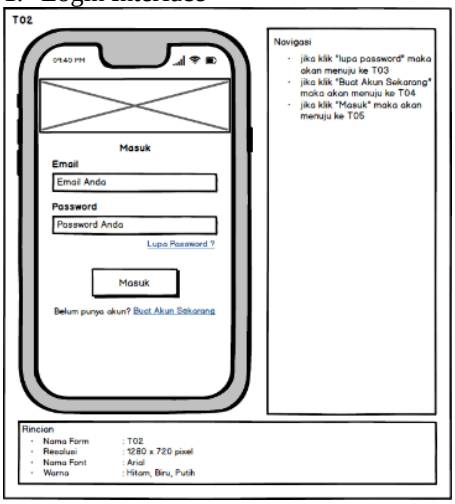

Image 3 Login Interface

2.Homepage Interface

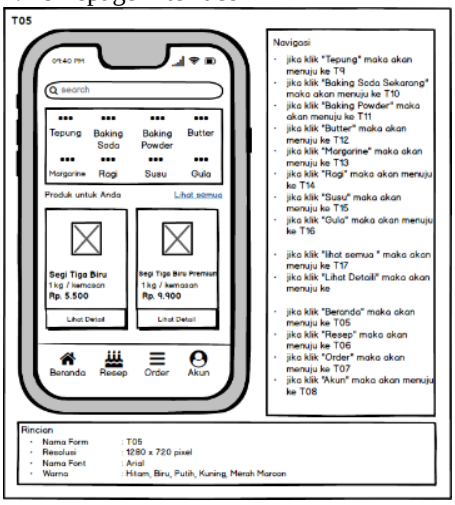

Image 4 Homepage Interface

3. Recipe Interface

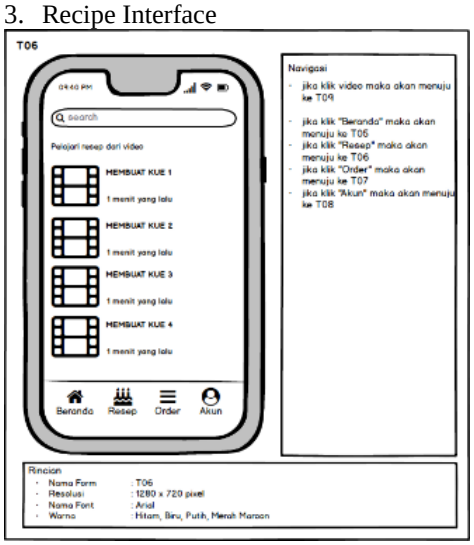

Image 5 Recipe Interface

2. Web Interface

The following is the display interface that was built:

1. Login Interface

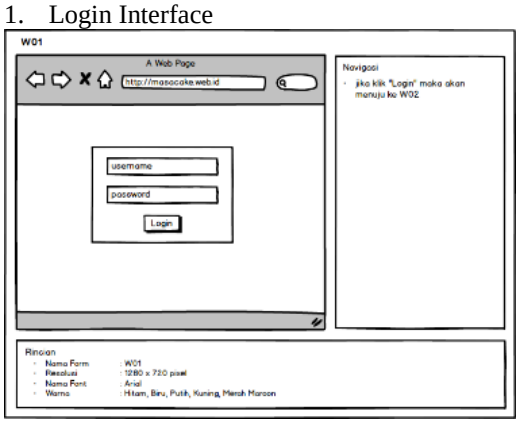

Image 6 Login Interface

2. Dashboard Interface

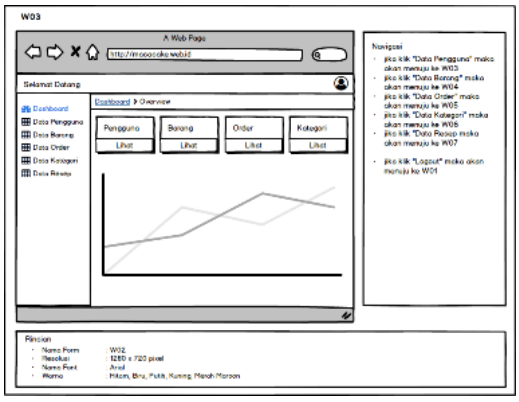

Image 7 Dashboard Interface

3. Interface Goods Data

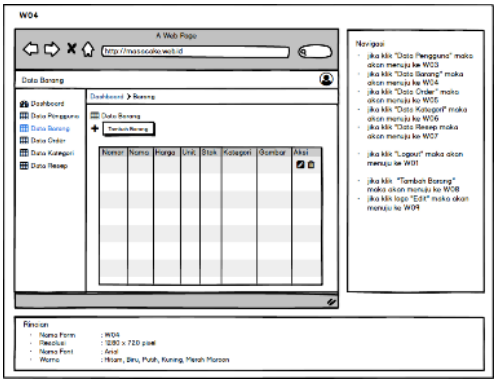

Image 8 Interface Goods Data

CLOSING

The conclusion that can be drawn from the results of application design is that this application really helps consumers determine what cake ingredients are needed and the estimated cost, helps consumers buy online without having to come to the store, and helps consumers get tutorials on how to bake.

BIBLIOGRAPHY

[1] T. Ervin Winardo, I. Arwani dan T. Afrianto, "Aplikasi penyedia Infromasi Pekerjaan Menggunakan Youtube API Pada Smartphone Android," vol. 2, 2018.

[2] D. Hansun dan S. Pratama, "Aplikasi Rekomendasi Tempat Makan Menggunakan Algoritma Slope One Pada Platform Android," vol. 11, no. ISSN, pp. 11-20, 2017.

[3] I. Akil, "Rekayasa Perangkat Lunak dengan Model Unifed Process Studi Kasus : Sistem Informasi Jurnal," *Jurnal Pilar Nusa Mandiri,* vol. XII, p. 1, Maret 2016.

[4] A. Anggraeni, I. Harjanto dan Hayat, "Pengembangan Usaha Micro Kecil dan Menengah (UMKM) Melalui Fasilitas Pihak Eksternal Dan Pihak Internal," *Jurnal Administrasi Publik (JAP),* vol. 1 no 6, pp. 1286-1295, 2013.

[5] E. A. Laksana, "Collaborative dan Aplikasinya," *Jurnal Ilmiah Teknologi Informasi Terapan,* vol. 1, no. 1, pp. 36-40, 2014.

[6] Arianto, S. Munir dan K. Khotimah, "Analisis dan Perancangan Representational State Transfer (REST) Web Service Sistem Infromasi Akademik STT Terpadu Nurul Fikri Menggunakan Framework," *ISSN.V Jurnal*

Teknologi Terpadu, vol. %1 dari %20, no. 2, pp. 1-26, 2016.

[7] S. H. Nazaruddin, Pemrograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android, Bandung: Informatika, 2015.

[8] M. Huda, Membuat Aplikasi Database dengan Java MySQL, dan NetBeans, Elex Media Komputindo.

[9] Hariyanto, Esensi-esensi Bahasa Pemrograman Java, Informatika, 2005.

[10] S. Surawijaya dan B. S. Eko, "Aplikasi Mobile Draver Online Berbasis Android Untuk Perusahaan Rental Kendaraan," no. ISSN 2085-4575, 2017.