BRAND SEARCH ENGINE APLICATION DEVELOPMENT FOR PRODUCT INFORMATION AND ROUTE RECOMMENDATION USING GPS ON ANDROID PLATFORM

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ABSTRACT

Brand is something that is very important for a product, in the rapidly growing creative industry, many brands are then emerging in the market, in addition to the already large and famous brand. Brand is one of the important factors in marketing activities. Brand is also a consideration that is done by consumers before making a decision to buy. Brand is a distinguishing mark on the goods or services of a company with other companies nya.Kita usually hesitate to enter the store with a logo or brand that is not recognized because it feels whether the goods are expensive or not.

This application offers a solution by photographing the logo or brand that is not in the familiar, then the application will send to google vision API for the detection of the logo. If you can, then the system will find information about the brand to know the price of his goods, promo information, and others. This application also provides information on similar brands whose prices are cheaper utilization of mobile technology using GPS

Based on the test results using the Black Box method can be concluded that the brand search engine application helps the public to obtain product information along with promos that are in progress at the store.

Keywords : *brand, search brand, google*

1. INTRODUCTION

1.1 BACKGROUND

Brand is something that is very important for a product, in the rapidly growing creative industry, many brands are then emerging in the market, in addition to the already large and famous brand. Brand is one important factor in marketing activities, because the activities of introducing and offering products or services can not be separated from the brand that can be rely on. Brand is also a consideration that is done by consumers before making a decision to buy. Brand is a distinguishing mark on the goods or services of a company with other companies. As a sign of distinguishing the brand in the classification of goods and services, must not have similarities between one another. [1]

Sometimes when shopping we get a brand that we do not know or a brand new, by offering various promos and discounts as well as a brand that is well known. From the results of the questionnaire that has been done there are 76.4% of 123 people who do not know about the brand new emerged.Terdapat 59.3% of the questionnaire that happens is Sometimes when want to know about the brand by checking to the store, but we are reluctant to enter due to price or product information that is less clear about the brand. Another thing that is a problem is when the brands are large and new, held promos and discounts on products that sometimes we do not know.

Based on the description of the problems described above and also based on the results of the questionnaire 94.4% of the 123 people often use search engines or search engines, then it becomes the basis of a brand application search engine. This application offers a solution by photographing the logo or brand that is not in the familiar, then the application will send to clarifai for the detection of the logo. If you have, then the system will find information about the brand to know the price of his goods, promo information, and others. This application also provides information on similar brands whose prices are cheaper utilization of mobile technology using GPS. This application uses the GPS feature (Global Position System) which is a satellite navigation system designed to provide instant positioning, speed and time information in almost any place on earth, any time and in any weather conditions. Utilization of mobile technology using GPS (Global Position System) aims to display shops that sell brands that are recommended.

Therefore, an application is needed to find a brand that will get product information and route recommendations from the brand. which can also compare the price of a brand with others that refers to the online stores. the Author feels the need to build a system entitled "APPLICATION DEVELOPMENT OF BRAND SEARCH ENGINE TO GET PRODUCT INFORMATION AND RECOMMENDATION ROUTE USING GPS ON THE ANDROID PLATFORM".

1.2 IDENTIFICATION OF PROBLEMS

Based on the above background, it can be identified the problems that exist are as follows:

1. Many people who do not know brand or brand newly emerged or created.
2. Product information, eg latest products, prices, promos, discounts and sales locations are hard to find.
3. There is no mobile app with location features to find the location of the store according to the nearest distance and compare prices with other online stores that provide brands of the same type.

1.3 PURPOSE AND OBJECTIVES

Based on the problems studied, the intent to be achieved by the author is to conduct research in order to analyze and build brand searching applications. The purpose of this research is as follows:

1. Provide ease in getting information about a brand.
2. Assist in providing product information, such as price, promo, discount and also location of sale.
3. Help provide recommendation of shortest distance to users who will go to the store where the brand sales.

1.4 SCOPE OF PROBLEMS

In making this Mobile Application can achieve the goals and objectives that are expected, then the problems are limited as follows:

1. Applications to be built based on Android mobile.
2. The application will run on Android operating system at least version 4.3 (Jelly Bean).
3. This app uses GPS technology
4. Tool used to build the application that is Android Studio.
5. The programming language used is Java Android.
6. The database used is MySql.
7. System modeling using object-oriented modeling with UML (Unified Modeling Language).
8. This app is only for brands that are related to fashion

2 CONTENT OF RESEARCH

2.1 TEORY

2.1.1 SEARCH ENGINE

Search engines are sites on the web designed to help users search for information stored on other websites and like the vehicles we use in exploring the universe in cyberspace. Without a search engine, we can only rely on a specific website address in accessing the required information, even if we have a website address. it will make us not able to go anywhere and will not access any website [1]. Search engines mine information and collect it in their database in three different ways, including:

1. Spirder / Crawler search engine

Crawler-based search engine is a search engine that automatically crawls every website therefore called spider / crawl that 'crawler' internet website and the findings obtained will be added to their database of search engines ie google [2].

2. Human-Powered Directory search engine

Human-Powered Directory search engine is also referred to as an open directory is very dependent on human presence in the legitimacy of the website to be added to their search engine database. Therefore in certain terms, this type is more accurate in assessing the website. This type of search engine is yahoo search [2].

3. Hybird Engine search engine

The combination of search engines that use crawler-based and human-powerd mode is called hybrid search engine. Examples of these search engines are DogPile and Meta-Crawler [2].

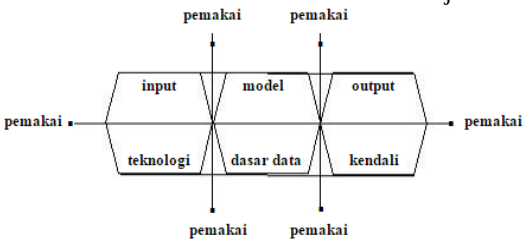
2.1.2 INFORMATION

Information can be defined "Information is data that has been processed into a form that is important to the recipient and has a real or perceived value in current decisions or upcoming decisions. So, in general information is data that has been processed into a more useful other form of knowledge or information intended for the recipient to obtain a info that can be useful, both in the present and in the future. Information generated from the application created is fire disaster information.

2.1.3 INFORMATION SYSTEM

An information system is a system that has the function of collecting, processing, storing, analyzing, and disseminating information for specific and useful purposes. The Components Information systems consist of components he called by the term building block (block), block model (model block), output block (block),

technology block (block technology) , database blocks (block databases) and control blocks (controls block). As a system, these six blocks each interact with one another form a unity to achieve its objectives.



Picture 1 Block Information System

1. Input Block

The input represents data that goes into the information system. Input here includes methods and media to capture data to be inserted, which can be basic documents.

2. Model Block

This block consists of a combination of procedures, logic and mathematical models that will manipulate the input data and data stored in the database in a certain way to produce the desired output.

3. Output Block

The product of the information system is output which is a quality information and useful documentation for all levels of management as well as all users of the system.

4. Block Technology

Technology is a "tool box" (tool-box) in information systems. Technology is used to receive inputs, run models, store and access data, generate and transmit outputs and help control of the system as a whole. Technology consists of 3 main parts, namely technicians (humanware or brainware), software (software) and hardware (hardware). Technicians can be people who know the technology and make it work. For example technicians are computer operators, programmers, data processing operators, telecommunications specialists, systems analysts, data storage and so forth.

5. Database Block

Database (database) is a collection of data that are interconnected with each other, stored in computer hardware and used software to manipulate it. The data needs to be stored in the database for the purpose of providing more information. Data in the database should be organized in such a way, so that the resulting information quality. A good database organization is also useful for the efficiency of storage capacity. The database is accessed or manipulated using a software package called DBMS (Database Management System).

6. Full Block

Many things can damage information systems, such as natural disasters, fire, temperature, water, dust, fraud, system failures, errors, inefficiencies, sabotage and so on. Some controls need to be designed and implemented to ensure that things that can damage the system can be prevented or if there already errors can be quickly addressed immediately.

2.1.4 GLOBAL POSITION SYSTEM (GPS)

GPS is a satellite infrastructure that serves the placement of positions of various objects (Speikerman 2004). GPS was first used for military purposes, but in the 1980s the United States government decided to make a positioning system freely and available for various industries in the world. According to (Roth 2004) GPS system consists of 3 segments [3]:

1. User Segment which consists of mobile devices from users (GPS receivers).
2. Space Segment consisting of satellites. Each satellite has an anatomic weight of 1.5 to 2 tons and has an energy independent of solar cells supplied.
3. Control segment administration required by satellite as correction of internet satellite data (system time and orbit).

GPS can perform calculations and determine the user's position and display in maps. If it is able to store the positions of the next user GPS can calculate other information, such as speed, direction of destination, route, destination of travel and distance of destination. The GPS is also utilized to build a fire disaster reporting application whereby the reporter delivers an accurate location and time calculation to determine the user's location information.

GPS Accuracy

The position shown by a GPS has an error factor or also called a level of accuracy. For example a GPS device shows a coordinate point with a 5 meter accuracy, that means the user's position may be within the radius of 5 meters from the indicated point. Why is the level of accuracy seen changing? Sometimes seen 10 meters, 15 meters, or 5 meters. There are several things that affect the level of accuracy, among others:

1. Ephemeris error. Occurs if the satellite can not properly transmit its position in orbit.
2. The state of the ionosphere. The ionosphere is at a distance of about 43-50 miles above the earth's surface. Although the GPS receiver attempts to correct / correct the delay factors that

occur, certain activities of the plasma can cause calculation errors.

3. The state of the Troposphere. The troposphere is the lowest part of the atmosphere up to a height of about 11 miles from the ground. Variations in temperature, pressure, and humidity can cause differences in the speed of reception of radio waves.
4. Time Error. Because the placement of an atomic clock on each GPS receiver is not working properly. The timing error of a GPS receiver that is not precise can lead to inaccuracies.
5. Multipath Error. Occurs because satellite signals hit hard surfaces (like buildings or cliffs) before reaching the GPS receiver. This can cause the delay so that the distance calculation becomes inaccurate.
6. Bad Satellite Signal. The obstructed sky circumstances will make GPS difficult to receive satellite data. A satellite signal that on a given day is received very well not necessarily on another day can be received with the same quality even if the user is standing in the same place.

4. Android and GPS

Today, technology is growing rapidly. In the past, the phone is only used for calling and SMS only. Now the phone has been transformed into a magic little box that is versatile. One of them is a phone with Android operating system. With the standardization of features and hardware owned, make Android phone a sophisticated phone that many people love. No longer sophisticated because of the features of MMS, radio, or high-speed internet but also because the embedded feature of satellite technology in it. Yes, the once large and exclusive GPS receiver device now can be owned by "just" buying a phone [3].

With mobile satellite technology (GPS), many things can be done. Want to see where the current user's position is in a map? Taking photos / videos that are already equipped with coordinate data? Want to know the path of cycling sport that has ever passed through the user? Not only that, users can also go to certain tourist attractions with guided pictures and sounds from a mobile phone! Even further, GPS can be used to help provide early warning of natural disasters. Today there are many developers for Android operating system including GPS applications. The fun of these applications are varied and the numbers are many.

2.2 SYSTEM ANALYSIS

2.2.1 SYSTEM ANALYS ARCHITECTURE

System architecture analysis aims to describe how a system sends data requests and how the system sends a response to the requested data until it reaches the user. Users use smartphone hardware as a medium to access the app.



Picture 2 System Architecture

From the picture above can be seen the flow of data requests that occur from the user application to the application users get the requested data is as follows:

1. SMARTPHONE photographed an unrecognized brand or logo, the photo was sent over the internet.
2. The photos are sent by internet access to the Google vision API for recognizable brands or logos that have been photographed by the smartphone.
3. Photos that have been processed in the google vision API will be in the database server process to get the same photo data list with additional information more complete.
4. The familiar brand or logo will be sent back to the Gmaps API to find out the location of the brand is based on the nearest route.
5. Complete information data of the brand image will be sent back via the internet to the smartphone
6. All the brand's data and route information will appear on the smartphone.

2.2.2 NON FUNCTIONAL NEEDS SPECIFICATIONS

The following will be explained about the non-functional requirement specification required

Tabel 3. 1 Non Functional Needs Specification

SKPL-NF	Software Requirements Specification
001	System built for android mobile devices
002	The system is built using a camera device
003	System built using Google API

2.2.3 FUNCTIONAL NEEDS SPECIFICATIONS

The following will be explained about the functional requirement specification required

Tabel 3. 2 Functional Needs Specifications

SKPL-F	Software Requirements Specification
001	The system provides facilities for admin login
002	System provides facility to add brand data for system admin
003	System provides facility to change brand data for system admin
004	System provides facility to delete brand data for system admin
005	The system provides the facility to add brand category data to the system admin
006	System provides facility to change brand category data for system admin
007	The system provides the facility to remove brand category data for the system admin
008	The system provides facilities to search for brands by category
009	System provides facilities for users to see the route to the store
010	The system provides facilities for users to view nearby stores
011	The system provides facilities for users to view the brand
012	System provides facilities for users to take photo by camera
013	System provides facilities for users to view webview search results

2.2.4 ANALYSIS OF SOFTWARE REQUIREMENTS

The software requirement analysis includes the minimum software requirements that the user must meet. The following are required software requirements:

Tabel 3. 3 Analysis of Software Requirements

No	Software Requirements
1	Minimum operating system android version 5.0 Lollipop
2	Smartphone connected to internet
3	Able to Activated GPS

2.2.5 ANALYSIS OF HARDWARE REQUIREMENTS

The system requires the user's smartphone hardware with the following minimum requirements:

Tabel 3. 4 Analysis of Hardwae Requirements

No	Requirements Hardware
1	Processor QuadCore, 1.2GHz
2	RAM minimum 1 GB
3	Operating System minimum android 4.4 kitkat

2.2.6 ANALYSIS OF USER REQUIREMENTS

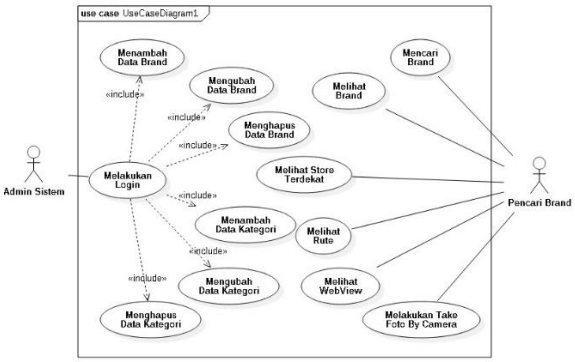
The following are the user requirements that must be met in order to access the system to be built:

Tabel 3. 5 Analysis Of User Requirements

Users	Criteria		Information
Users Application	Minimum age of users	No Limit Age	-
	Operating system to uses	Android	-
	Have Uber account	Premium	Provide to order product by Uber

2.2.7 USE CASE DIAGRAM

The following is a use case diagram designed for applications to be built:



Picture 3 Use Case Diagram

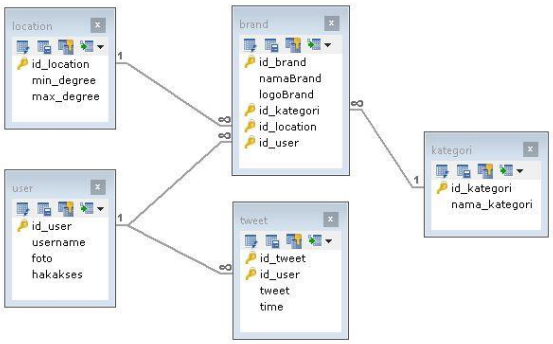
7. DESIGNING

System design is the stage of making the design for the database built using MySQL, menu structure, and user interface that will be used on the system.

2.3.1 RELATION SCHEME

Relation scheme is a relationship between the tables used in the database to be used. The following is a description of the relation scheme

used:

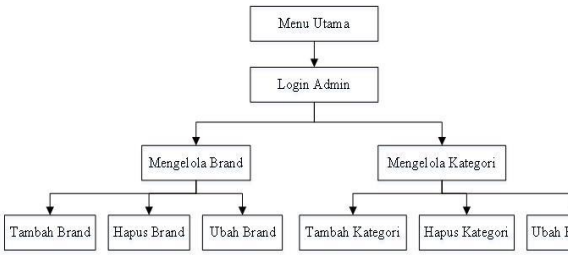


Picture 4 Relation Scheme

2.3.2 MENU STRUCTURES

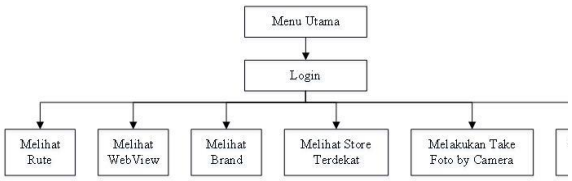
Menu structure is the arrangement of the menu to then be applied to the system built in order to facilitate in view the menus that can be accessed in the application. Here is a menu structure that has been built:

1. Structures of Menu Admin



Picture 5 Structures of Menu Admin

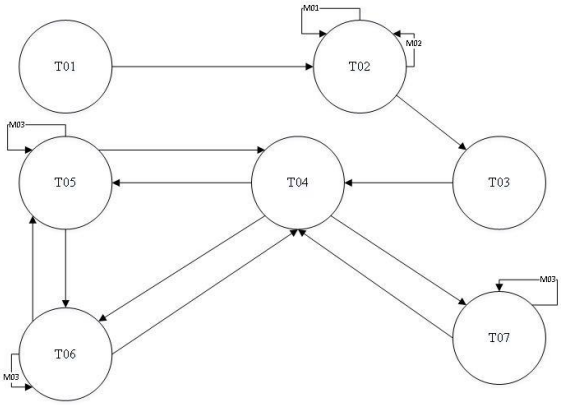
2. Structures of Menu User



Picture 6 Structures of Menu User

2.3.3 SEMANTIC NETWORK

Jaringan semantik digunakan untuk melihat hubungan dari tampilan antarmuka serta perancangan yang telah dibuat sebelumnya. Di bawah ini merupakan jaringan semantik yang telah dibuat untuk sistem yang akan dibangun:

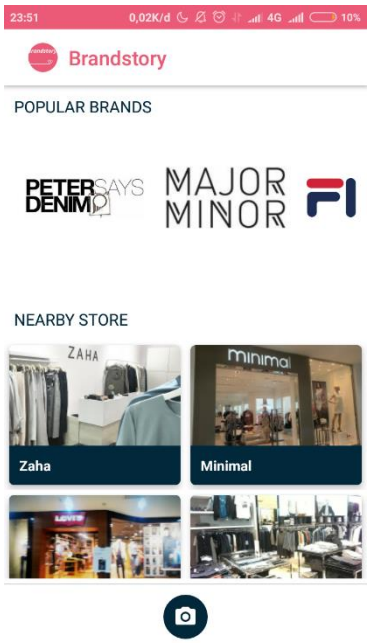


Picture 7 Display of Semantic Network

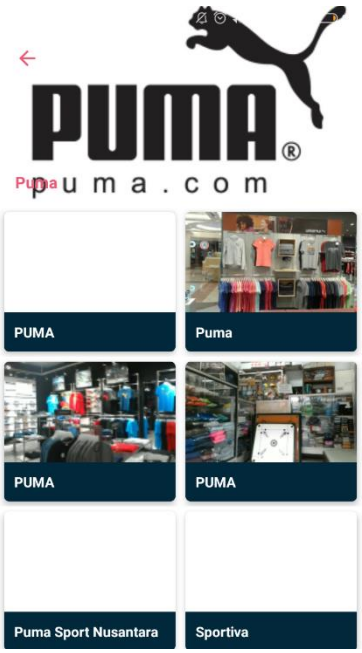
2.3.4 SCREENSHOT PROGRAM

Here are some screenshots taken from programs that have been running.

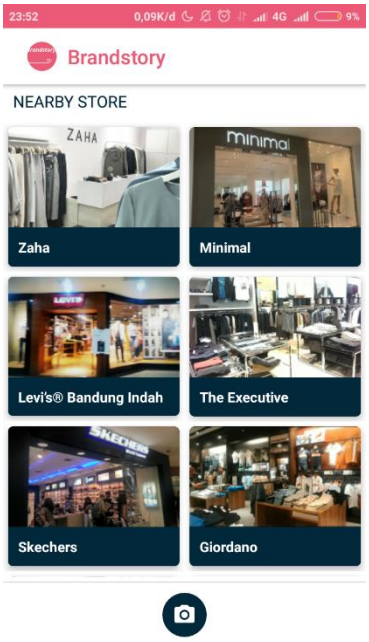
1. Main Page



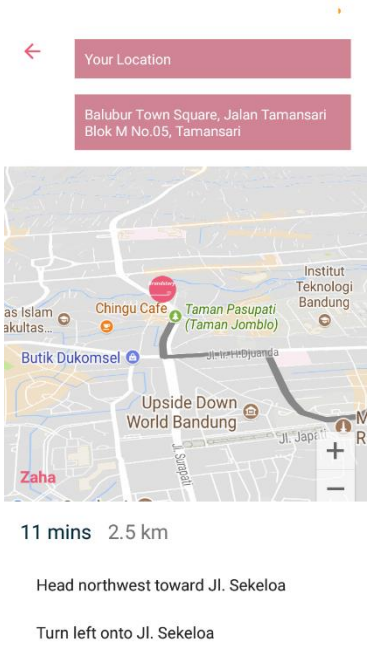
2. Page Of List Nearby Store



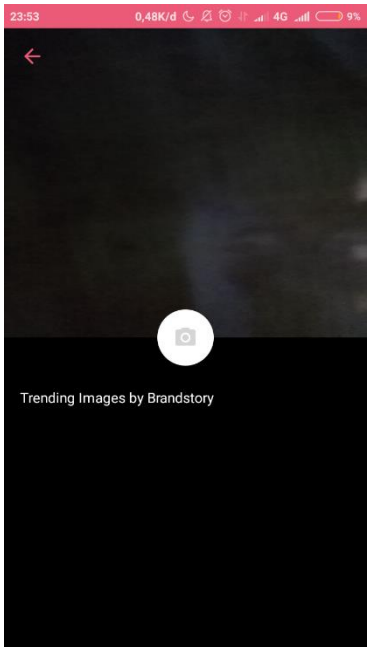
3. Page of List Nearby Store



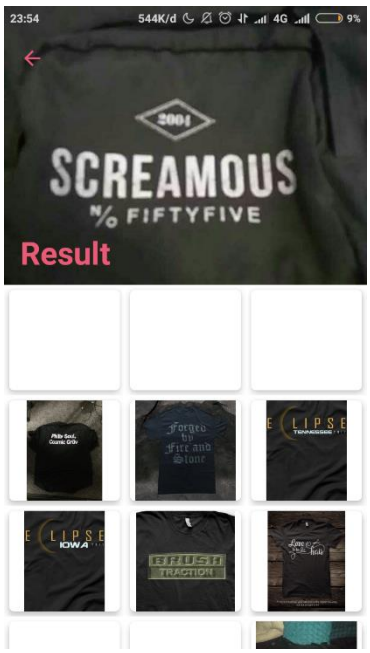
4. Page Of Rute



5. Page of Object Photo



6. Page of list item manifold



8. SYSTEM TESTING

Testing the system to be performed is functional testing using blackbox method and the spread of the questionnaire online which aims to perform direct testing by users where users can use the application and fill out the questionnaire that has been provided to obtain a lack or system error that may occur when the user using the application that has been built.

The test scenario contains the steps to be performed in system testing. The system testing scenario contains a functional testing scenario that will be performed with blackbox testing and beta testing scenarios.

1. Blackbox Testing Scenario

Blackbox testing scenario that will be done is as follows:

Tabel 4.1 Scenario Blackbox Testing

No	Tesing Class	Type Testing	Method
1	Add of data brand	*Blackbox*	*Equivalence Partitioning*
2	Edit of data brand	*Blackbox*	*Equivalence Partitioning*
3	Delete of data brand	*Blackbox*	*Equivalence Partitioning*
4	Add of data category	*Blackbox*	*Equivalence Partitioning*
5	Edit of data category	*Blackbox*	*Equivalence Partitioning*
6	Delete of data category	*Blackbox*	*Equivalence Partitioning*
7	Search of data brand	*Blackbox*	*Equivalence Partitioning*
8	View of data brand	*Blackbox*	*Equivalence Partitioning*
9	View of near store	*Blackbox*	*Equivalence Partitioning*
10	*take photo by camera*.	*Blackbox*	*Equivalence Partitioning*
11	View of webview	*Blackbox*	*Equivalence Partitioning*
12	View of rute	*Blackbox*	*Equivalence Partitioning*

1. Beta Testing Scenario

Beta testing is done by distributing questionnaires to 40 respondents. The questionnaire will contain 8 questions which will then be processed using the Likert Scale method. Here is a question that will be shared with respondents:

o Can the app display brand data?
o Can the application search the brand data according to the input?
o Can the app provide the closest data store?
o Can the app take photos for the process?
o Can the app display webview?
o Does the data application show the route?
o Is the app useful for users?
o Does the application fit the user's needs?

The above question has the answer weight with the following rating:

Weight Value	Answers
1	Strongly Disagree
2	Disagree
3	Average
4	Agree
5	Strongly Agree

Then from the questionnaires that have been successfully filled by the respondents, done calculations to find percentage of respondents' answers with the formula descriptive analysis percentage as follows:

$$p = \frac{f}{N} * 100\%$$

Where,
p : Percentage
f : Frequency Of Answers
N : Number Of Respondents

3 CLOSING

3.1 CONCLUSION

Based on the results of the analysis and implementation gained in making this final task, it can be concluded that the results of the development of brand search engine applications are very helpful in finding popular brands, with its location feature is also very helpful for people to get easier to where the brand is sought. Here is the result of the development goal of brand search engine application and obtained the following results:

1. The creation of brand search engine applications to provide accurate information to the public in order to obtain information products from unknown brands.
2. The creation of brand search engine applications to provide information on the road that will be traveled by the public to the store of a brand that has been in search first.
3. The creation of brand search engine applications provide similar product information to the user.

4. SUGGESTION

The android based fire disaster reporting software built is an application that focuses on the brand search engine apliaski, therefore there are some suggestions that can be used as a blend of software development to better support the growth of users and content in this software. The suggestions on the development of software that is built is as follows:

1. Always update the stores of the latest or new brand
2. Develop an application to find other products.
3. Developing this app to support on other platforms like ios and windows phone.

REFERENCES

[1] Sulianta, Feri. "Seacrh Engine Pilihan untuk Berbagai Kebutuhan. Jakarta: Elex Media Komputindo, 2012.

[2] H. Nur,N. Dini,W. Ardianto "Aplikasi Mobile Advertising Informasi Diskon dan Promo Toko Berbasis Location Based(LBS)," *Jurnal Aksara Komputer Terapan Politeknik Caltex Riau*, vol. Vol.4 No.2, 2015.

[3] M. Ari, "Sistem Informasi Geografis Pelaporan Masyarakat (SIGMA) Berbasis Foto Geotagging," *Universitas Tanjungpura*, 2014.