DEVELOPMENT OF BENGKULU PUBLIC SERVICE APPLICATIONS USING TECHNOLOGY USING SMARTPHONE BASED ON ANDROID

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ABSTRACK

Smart Bengkulu is a public service application by utilizing Location Based Services (LBS) technology based on android. Location Based Services (LBS) is a location-based service used to locate devices that users use, these services use Google's Global Position Service (GPS) and cell-based location technology.

Smart Bengkulu can be used in some service features, this application can facilitate the reporting of public complaints, information the head of the region, and tourist information. With Location Based Services (LBS) technology embedded in android devices, the government can know the location of the problem point that occurs in the community environment.

Based on the test results using blackbox testing and beta testing can be concluded that the smart application Bengkulu can facilitate the public in conveying complaints and simplify the government in delivering the event to the public

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Keywords: *Location Based Services (LBS), Global Position Service (GPS), Smart Bengkulu (Public service application).*

1. PENDAHULUAN

Bengkulu city government itself in 2016 is to build the concept of Smart City to support government programs in terms of infrastructure. At this time the city of Bengkulu has built a Digital Park for the beginning of their Smart City concept, which works directly with PT.Telkom Indonesia.

Based on the data of Kemendagri Indonesia in 2016 there is a Damage road along 1200 kilometers (km) in the province of Bengkulu. Among them 80% of roads damaged Weight and 20% of roads slightly damaged. As for Bengkulu city based on statistical agency for Bengkulu City area approaching 100 kilometers (km) 9.1% of the total in Bengkulu Province that suffered damage. Of course that figure with the greater majority of residents living in cities than districts, has an impact on the urban and district communities. The community itself found difficulties in reporting complaints especially damaged roads, due to the slow response of the government in solving this problem.

The next problem is waste that has not been handled intensively from the government. Data on newspapers is 240 tons of garbage every day in 2016. And the unavailability of garbage containers in every urban village that is not evenly distributed covers all areas of Bengkulu city. So many reports of citizens who complain and disturb the health of citizens. Plus the government's lack of sensitivity in solving this garbage problem.

The problem of uneven distribution in the area of Bengkulu city is often a problem. Where people often occur accidents due to lack of lighting in certain road areas. The government is fully responsible for the problems that occur in the community, plus the community is difficult to report their complaints due to lack of government facilities in handling the problem.

From the head of the region itself has difficulty in delivering various events or events within the city, often using print media or local television stations to deliver city events events.

The problem of tourism, like other urban cities the number of cities that want to increase the attractiveness of tourists both domestically and abroad, based on the results of interviews with Bengkulu city secretary of their difficulties in promoting. When there are tourists who come there then sometimes tourists do not know what tours exist in the province of Bengkulu, even they are difficult to get the tourist location

.

Purpose and objectives

1. With this application speed up the information Society to get to the government in solving any special problems road damage, garbage and lighting.
2. With this application allows every community coming from outside the city of Bengkulu to find out every tourist in the city of Bengkulu and can know the location of the tour.

1.2 Android Studio

Android Studio is the official IDE for Android app development, based on IntelliJ IDEA. On top of IntelliJ's powerful code editor and tool developer, Android Studio offers more features that increase your productivity when building Android apps, such as:

1. A flexible Gradle-based build system
2. Build variants and multiple generations of APK files
3. Code templates to help you build common application features
4. A rich layout editor with support for drag and drop editing themes
5. Lint tool to capture performance, usability, version compatibility, and other issues
6. Code shrunk with ProGuard and resources shrink with Gradle
7. Built-in support for Google Cloud Platform, making it easy to integrate Google Cloud Messaging and App Engine.

2.1.1.1 Project Structure

Each project in Android Studio contains one or more modules with source code files and resource files. Different types of modules include:

1) Android app modules
2) Test modules
3) Library modules
4) App Engine modules

By default, Android Studio displays your project files in the Android project view. This view is organized by modules to provide quick access to your project source key files. All build files are visible at the top level under Gradle Script and each application module contains the following three elements:

1. Manifests: Manifest file.
2. Java: Source code file.
3. Res: Resource file.

The Android project's structure on the disk differs from this flat representation. To view the actual file structure of the project, select Project from Project drop-down. You can also customize the look of project files to focus on certain aspects of your app development. For example, selecting your project display problem displays a link to the source file containing any recognized coding and syntax errors, such as missing the closing XML tag element in the layout file

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1.3 GPS (*Global Position Service*)

GPS (Global Position Service) is a satellite-based navigation system developed by U.S. Department of Defense (DoD). In the early 1970s GPS was originally developed as a military system to meet military needs. However, the latter is made available to civilians, and is now a dual use system accessible to military and civilian users. GPS provides a continuous position and timing information every where in the world under any weather conditions. Because, it serves an unlimited number of users and is used for security reasons. GPS uses a one-way-ranging (passive) system. That is, users can only receive satellite signals.

GPS satellites must always be in the proper orbital position to maintain the accuracy of the data sent to the GPS receiver, so it must always be maintained to the right position. The positions of these satellites are always monitored by the control station. The controlling stations on earth are in Hawaii, Ascension Islan, Diego Garcia, Kwajalein and Colorado Spring. To be able to know the position of a person is required a tool called GPS receiver that serves to receive signals sent from GPS satellites. The GPS receiver takes the information and performs a triangulation calculation to determine the exact location of the user. The GPS receiver compares the time the signal is sent with the time the signal is received to know the satellite distance. By knowing that distance, the GPS receiver can calculate and determine the user's position and display it in an electronic map. After determining the user's position, then GPS can calculate other information, such as speed, destination, path, destination, destination distance, sunrise and sunset and more.

GPS satellites are very precise in sending information because the satellites use atomic clocks. The atomic clocks on the satellites are isolated atomic particles, so they can produce accurate clocks compared to regular clocks. The specialty of GPS is able to work in various weather conditions, day or night. Accuracy of a GPS device can reach 15 meters, even the latest models equipped with Wide Area Augmentation System (WAAS) technology up to 3 meters accuracy. Because GPS works by relying on satellites, its use is advisable in the open. Use indoors, or in places that block the direction of satellites (in space), the GPS will not work accurately and maximally. Accurate timing accurately determines the accuracy of calculations to determine location information. The more satellite signals that can be received the more precision the resulting position data. In addition, the height also affects the workings of GPS, because the higher the cleaner the atmosphere, so the less disruption

API (*Application Programming Interface*)

API is a set of commands, functions, and protocols that can be used when building software for a particular operating system. API allows programmers to use standard functions to interact with the operating system. API or Application Programming Interface is also a documentation that consists of interface, function, class, structure to build a software.

With the API, it allows a programmer to unpack a software to then be developed or integrated with other software. API can be regarded as connecting an application with other applications. A standard routine that allows developers to use system functions. This process is managed through the operating system. The advantage of this API is to allow an application with other applications to interact with each other.
The advantages of using the API are as follows:
1. Portability.
Developers who use the API can run the program in any operating system as long as it has installed the API.
2. More Understandable
The API uses a more structured and understandable language than the system call language. This is very important in terms of editing and development.
How to use the API:
1) Performed by importing package / class.
2) There are several different named named dipackage classes, which are:
A. Import one and use the full name for the other.
B. Use the full name of all classes
Most Operating Systems such as Windows, provide API facilities so that programmers can perform programming activities more consistently. Although the API is designed for programmers, it is also good for the user because it can guarantee at least that the program has the same interface, making it easier to learn

1.4 PHP (*Hypertext Preprocessor*)

PHP is a programming language that runs in a web server (server side). PHP is a very popular scripting language used to develop web applications, although PHP can also be used to develop desktop applications, both console and GUI-based. 1.4.1.1 Basic Concept of PHP PHP code begins with a smaller (<) sign and ends with a bigger sign (>). There are four ways to write PHP scripts, namely: 1. <? Hello?> 2. <? Php Hallo?> 3. <% Hallo%> 4. <SCRIPT LANGUAGE = "php"> Hallo </ script> The separator between instruction is semicolon (;) and to create or add comments / standard of writing is: / * comment * /, // comment, # comment. The way of writing is differentiated into Embedded and Non Embedded scripts. 1.4.1.2 PHP Variable PHP variables are used to store data whose value can be varied. In PHP language, variables start with a "$" sign. The rules of writing variables include the following: A. There are only 3 characters that can be used for variable names, ie letters, numbers and underscores. B. The first character after the "$" sign must be a letter or underscore. C. If variable names are more than one word, there should be no space between them. 1.4.2 Advantages of PHP PHP (Hypertext Preprocessor) is a script that runs in server side that is added in HTML. This script will make an application can be integrated into HTML so that an HTML page is no longer static, but become dynamic. The nature of server side is to make the script work is done on the server while sent to the browser is the result of the process of the script is already in the form of HTML. The advantages of its server side are [10]: A. There is no need for browser compatibility or having to use certain browsers, because the server is the one who will work on the script. Results that are sent back to the browser are usually in the form of text or images that can be recognized by any browser. B. Can take advantage of application resources owned by the server, for example: the relationship into the database. The original script is not visible so security is more secure

2.1 ISI PENELITIAN

2. 1 Problem Analysis

`Identifying (the problem) is the first step in the system analysis phase. Problems can be identified as a question that is desirable to solve. This problem causes the objectives of the system not to be achieved. Therefore, the first step to be done at this stage is to first identify the problems that occur.
Based on the results of questionnaire surveys to the public and direct presentations in the government of Bengkulu City. Questionnaires were conducted to 30 samples of people from various working groups, and from the results of questionnaires conducted to the community found several problems, namely:
1. Lack of information about various public complaints to reach the government so that often the slow handling of government.
2. Uneven and affordable development by the city government Because of the difficulty of getting information about the location point of the problem that occurred.
3. The difficulty of the Government in delivering several important events in the city to the community quickly and frugally

2.2 System Architecture Analysis
System architecture analysis aims to identify the architecture to be built based on two web and mobile subsystems.
System architecture analysis aims to identify the architecture to be built based on two web and mobile subsystems.
1. Web
The web platform is one of the subsystems chosen for the development of this software. Users of this platform software are administrators. The administrator is responsible for confirming the contents of the balance. Below is Figure 3.6 Software Architecture on the Web Platform. This image describes the overall architecture of the system on a web platform.



Gambar 1.1 Analisis Arsitektur Sistem web

Here is a description of Figure 1.1 Software Architecture on the Web Platform:

A. Web admin to request data to web server.

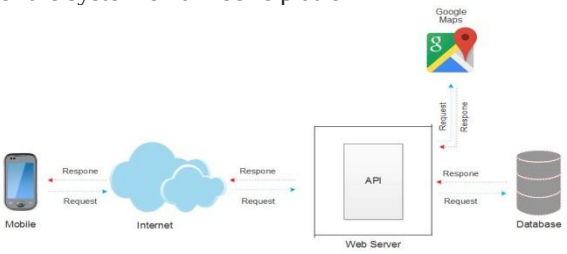
B. The web server receives a data request and determines the type of request requested.

C. If the web server receives a data request it will immediately retrieve the data in the database server.

D. Once the web server receives the requested data, the data will be restored over the internet to the admin computer.

2. Android

The mobile platform is one of the subsystems chosen for the development of this software. The software architecture on the mobile platform illustrates how software interacts as illustrated in Figure 3.7 Software Architecture on the Mobile Platform. The image depicts the overall architecture of the system on a mobile platform



Gambar 1.2 Analisi Arsitektur Sistem Mobile

Here is a description of Figure 1.2 Software Architecture on Mobile Platform:

A. Mobile device users request data to the web server via the API.

B. The web server receives a data request and determines the type of request requested.

C. If the web server accepts the location request then the server calls the Google Maps URL to get the coordinates.

Google Maps sends the results of the respone to the server.

E. If the web server receives a data request then the web server will retrieve the data in the database.

F. Once the web server receives the requested data, the data will be returned in JSON form for user-processed mobile device

2.3 Spesifkasi Kebutuhan Perangkat Lunak Fungsional di *Platform Mobile*

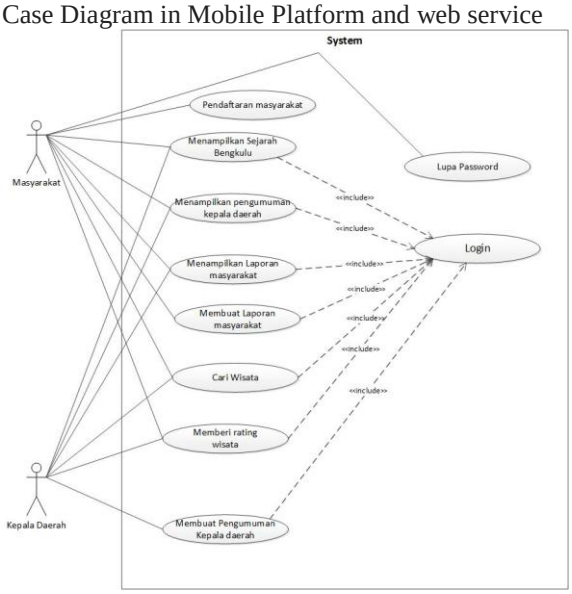
Spesifikasi Kebutuhan Perangkat Lunak Fungsional di Platform Mobile	
SKPL-F	**Spesifikasi**
001	Sistem menyediakan fasilitas login
002	Sistem menyediakan fasilitas lupa password
003	Sistem menyediakan fasilitas pendaftaran masyarakat
004	Sistem menyediakan fasilitas Melihat Sejarah Bengkulu
005	Sistem menyediakan fasilitas Menampilkan Pengumuman kepala daerah
006	Sistem menyediakan fasilitas membuat pengumuman kepala daerah
007	Sistem menyediakan fasilitas Menampilkan Laporan warga
008	Sistem menyediakan fasilitas buat laporan warga
009	Sistem menyediakan fasilitas cari wisata
010	Sistem menyediakan fasilitas memberi rating wisata

1.4 Functional Needs Analysis on Mobile Platforms

Analysis of functional requirements in mobile platforms is done using UML tools, while the stages of analysis using UML include use case diagrams, use case scenarios, activity diagrams, and class diagrams. The analysis of functional requirements in the android mobile platform will be explained as follows

2.5 Use Case Diagram

Use Case Diagram is a construction to describe the relationships that occur between actors with the activities contained in the system. From the analysis of existing application users then use case diagram in mobile platform can be seen in Figure 1.3 Use Case Diagram in Mobile Platform and web service



Gambar 1.3 Use case

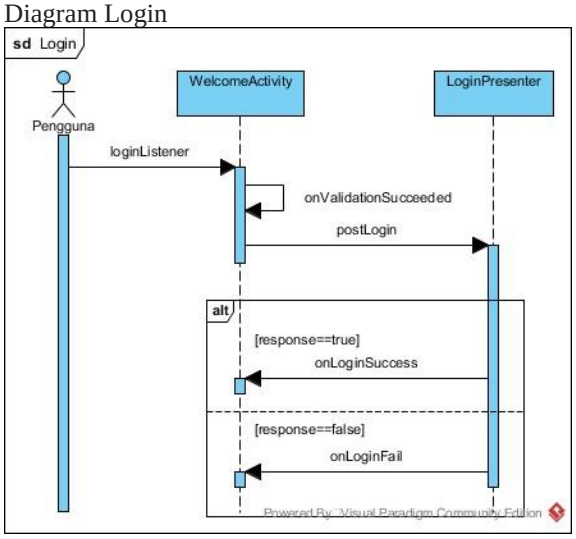
2.6 Sequense Diagram

Sequence Diagram is a description of the interaction of each object in each use case in time sequence.

This interaction involves sending a series of data between objects that interact with each other. Here is a sequence diagram that can be described, such as

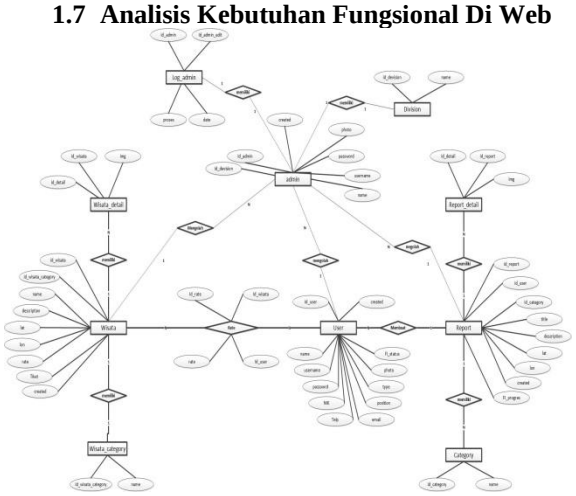
1. Sequence Diagram Login

Here is an interaction between the actors with the objects that exist in the login process. Sequence Diagram login can be seen in Figure 3.19 Sequence Diagram Login



Gambar 1.4 sequence Login

1.7 Analisis Kebutuhan Fungsional Di Web



Gambar 1.5 Diagram E-R

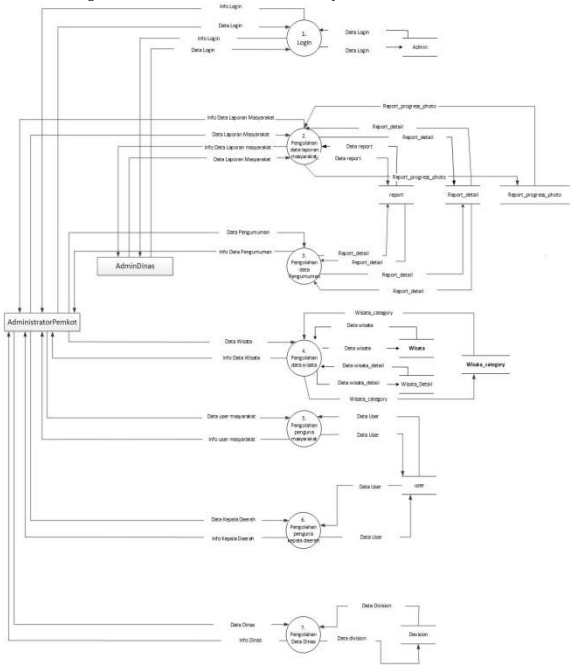
2.8 Context diagram

Context diagram is one of the tools in conducting structured analysis. This context diagram describes a system in outline and the whole course. In the context diagram is also described external entities that are brainware that produces data that will be processed system and the purpose of information generated by the system. The context diagram proposed is shown by Figure 1.6 Context Diagram.



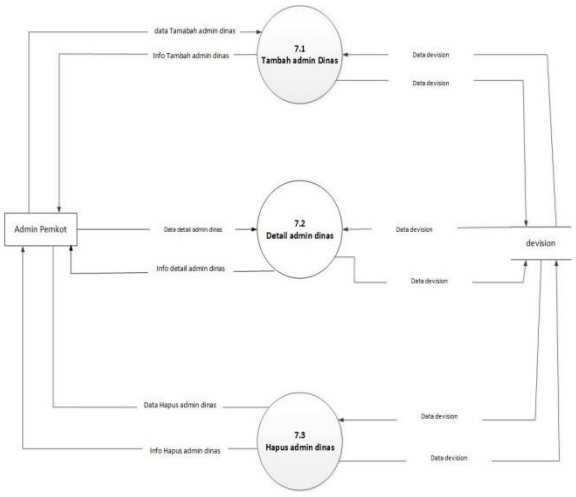
2.9 DFD (Data Flow Diagram)

Data Flow Diagram is a representation of a system that describes the parts of the system to be built along with the linkage between the parts that exist. From this Data Flow Diagram one can know the source of the information in the system as well as the purpose of the input coming from the external entity. The Data Flow Diagram on the construction of the system on the website platform is as follows



Gambar 1.7 DFD Level 1

DFD Level 2 Process 7.1 Data flow diagram level 2 process 6 of the application to be built can be seen in Figure 1.8 DFD Level 2



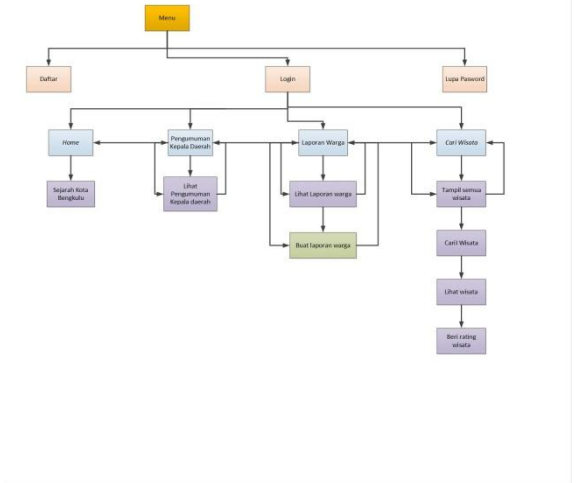
Gambar 1.8 DFD Level 2

2.10 Data Dictionary

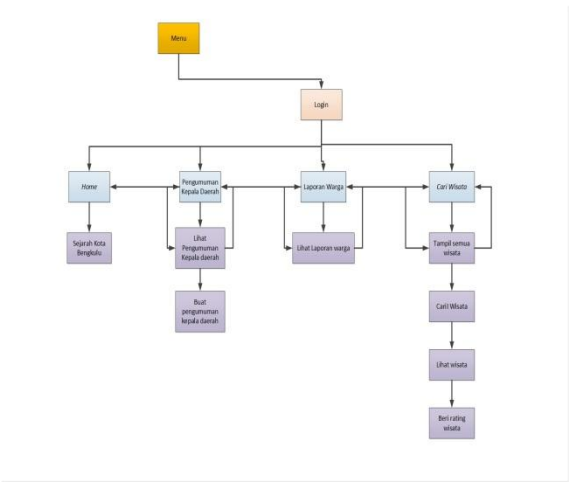
Data Dictionary is a formal description to describe all data enclosed in DFD, then used data dictionary. The data dictionary contained in the system created can be seen in Table 3.48 Data Dictionary.

2.11 Menu Structure

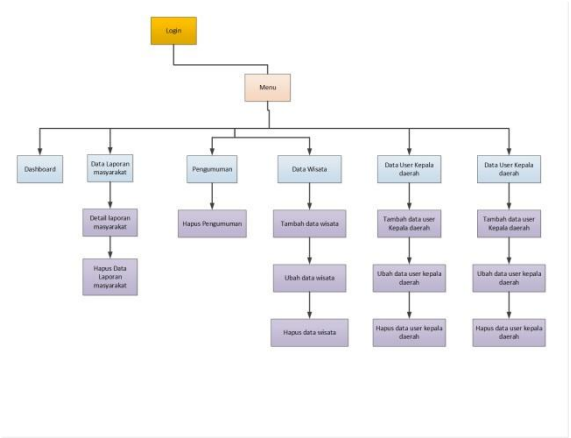
The design of the menu structure is a description of the application path so that applications are easy to understand and easy to use. The design of the menu structure of the development of application development of public services city of bengkulu can be seen as follows2.11 Structure Menu Mobile Society



Gambar 1.9 Struktur Menu Mobile Masyarakat



Gambar 1.10 Struktur Menu Mobile Kepala daerah

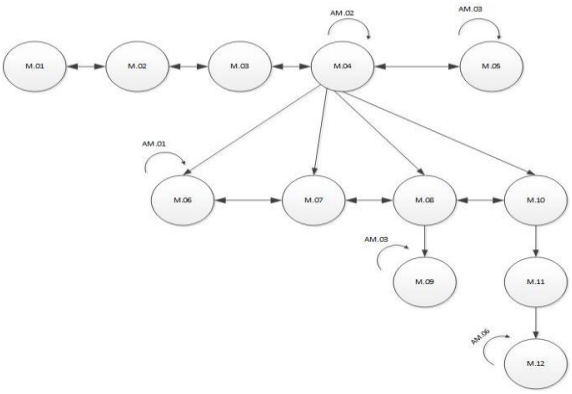


Gambar 1.11 Struktur Menu Web admin Pemerintah

2.11 Jaringan simantik

Semantic network is a graphical representation of knowledge that shows relationships between objects, consisting of circles connected with arrows that show objects and information about them.

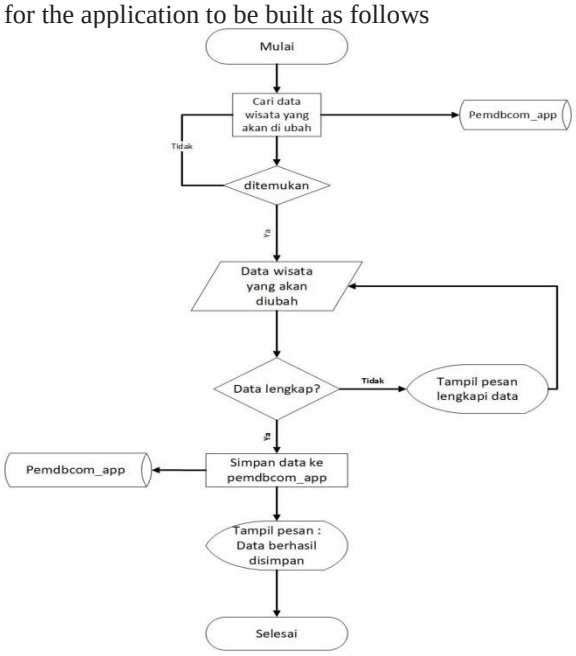
A. Semantic Networks Mobile community subsystem Here is a mobile community semantic network



Gambar 1.12 Jaringan Semantik Mobile Masyarakat

2.12 Procedural Design

Procedural design is the procedure or sequence of steps to perform a process. The procedural design for the application to be built as follows



Gambar 1.13 Procedural Design

2.12 Implementasi sistem

The system implementation stage is a design translation phase based on the results of the analysis into a specific programming language as well as the application of software built in the real environment. The discussion of system implementation consists of software specifications, hardware specifications, and interface implementation

The following is a hardware implementation table: Hardware Specification Computer is a specification of computer hardware used in Bengkulu City Public Service Android Applications can be seen in Table 4.1 Implementation of Computer Hardware

Tabel 2 implementasi perangkat keras

Jenis	Spesifikasi
Prosesor	2 *core* dengan kecepatan 2,3 GHz
RAM	2 GB
Harddisk	120 GB
Monitor	10 Inci

Specification android hardware requirements are hardware specifications android used in Public Service Applications Bengkulu City can be seen in Table 4.2 Android Hardware Implementation.

Tabel 3 **Implementasi Perangkat Keras *Android***

Jenis	Spesifikasi
Prosesor	1 *core* dengan kecepatan 830 MHz
RAM	512 GB
Memory internal	2 GB
OS	Android 5.0 Lolipop

2.13 Implementasi Perangkat Lunak

Software for system implementation process includes operating system, IDE, browser and text editor to write code. Table 4.3 is a software implementation used to build Public Service System of Bengkulu City can be seen in Table 4Table Implementation Software.

Beta Test Results

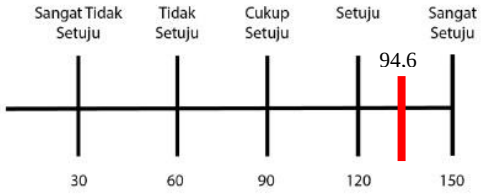
Based on the results of questionnaires given to Masyrarakat as sampling, can be searched percentage of each answer by using the formula:

Information :
Y: Percentage Value
P: Total Score
Q: High Scores

Y = P/Q*100%

To measure the attitude of users of applications that have been built can use likert scale. According to Prof. Dr. Sugiyono, Likert Scale is a scale used to measure perceptions, attitudes or opinions of a person or group of people about an event or a social phenomenon, based on the operational definition set by the researcher. The following is the score given for answers to the questionnaires that have been given to the research of the authors

(1) Do you agree the Smart Bengkulu application can help speed up your complaint information to the city administration?



3 PENUTUP

Based on the results of testing and discussion that has been made then can be drawn conclusion as follows:

1. Smart Bengkulu application makes it easy for the public to convey complaint information to the government quickly.
2. Smart Bengkulu application also provides convenience to the government in delivering various information or event of the city to the community quickly and frugally.
3. Smart Bengkulu application provides convenience to the community from outside the city of bengkulu to know the existing tourist information in the city of bengkulu

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