

Geographical Information System Mapping the Billboards in Samarinda

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Abstract-Advances in information technology on geography are increasingly needed by many people, for example information on distances between regions, locations, facilities and many other information. The information is needed by users for various purposes such as research, development, design and regional natural resource management. Because of this geographical presence can help the presentation of a more interactive information, where users can access a complete geographical information using only a computer, a web-browser and internet network. So to get that information all in need of a Geographical Information System (GIS) The purpose of this research is to create a web that contains information on the location of billboards in the city of Samarinda. While this research is expected to make it Easier for users to Obtain information on the location of billboards in Samarinda.

Keywords - Mapping, Geographical Information, Billboards, Web

I. INTRODUCTION

Samarinda city is the provincial capital of East Kalimantan, Indonesia as well as the largest city in the whole island of Borneo. Samarinda has an area of 718 km² with geographical conditions hilly area. Samarinda city is dissected by the Mahakam River which gives access to the village and town to another in East Kalimantan through the river, land or air. Samarinda developments in the rapidly growing information one of which billboards scattered around the city of Samarinda. Much of the information that can dapatkan of advertisement.

Signage is an effort to provide information or give you an idea, goods or services, with a view to attract the attention of people to the goods or services were informed through billboards scattered in Samarinda. Billboards become one of the local tax revenue in Samarinda and installation of billboards scattered on the outskirts of the city of Samarinda is not arbitrary for the pairs, since no regulations or legislation to permit the installation of billboards.

Geographic information about the technological advances are increasingly required by many societies for example, distance information between regions, locations, facilities and lots of other information. The information required users for various purposes such as research, development, designing territories and natural resources management. Due to this geographical information can help presenting a more interactive, where users can access a complete geographic information simply by using a computer, a web-browser and Internet networks. So to get that information all in need Geographical Information System (GIS), known as Geographic Information System (GIS).

The study was confined to matters as follows:

1. Preparation of GIS use of Google maps API.
2. Scope billboard mapped in GIS is in the city of Samarinda.
3. The design of the system is done by using the programming language PHP, Java Script and HTML.
4. This system must be connected to the Internet to display the map google map.
5. The advertisement is displayed is the type of advertisement Billboard, Billboards and Videotron.

The purpose of this research is to create a web that contains location information billboards in the city of Samarinda. While This research is expected to facilitate the user to obtain information about the location of billboards in the city of Samarinda.

II. LITERATURE REVIEW

A. Study of literature

Some of the literature is used as a guide and reference in this final project, among others:

1. Research conducted by Rahardjo, 2013 from the University of Surabaya, entitled "Creation of a Geographic Information System (GIS) Search Location Workshop", The Making of a geographic information system location search workshop can be one alternative In the study made is Application To determine the location search workshops and implementation of the application is done using the PHP programming language, framework Code Igniter, Google Maps API version 3, and the MySQL database.
2. Research conducted by Masykur, 2014 from Muhammadiyah University Ponorogo, entitled "Implementation of Geographic Information Systems Using Google Maps API Mapping Origin Students" Mapping the students do with harnessing the map that is provided by Google called Google Maps API. Google Maps is a free service provided by Google. Google Maps is a map of the world that we can use to view an area. In other words, Google Maps is a map that can be viewed using a browser. We can add features of Google Maps in the web that we have made or on our blog paid or free even with Google Maps API. Google Maps API application is a JavaScript library that form.
3. According Aliyah, 2014 in a research entitled "Geographic Information System Web-Based Regarding Distribution of Educational Facilities, Housing and Hospital in Bekasi" aims to be able to present the information in an integrated manner from

the data spatial and non-spatial data, besides providing convenience to users such as community and the local government of Bekasi in the search for the location of educational facilities, housing and hospitals.

4. According Nurdiansyah and Abdulah, 2018 entitled "Geographic Information Systems School of Cianjur Regency Based Web" in the hope making of information system that will make the search a variety of information about schools in Cianjur easier to efficiently and effectively, a geographical information system that school can provide information on achievements school, school status, extracurricular available and the location of the school. A geographical information system was created using internet technology so that it can be opened by common and can make the delivery of information about schools in Cianjur.
5. Based on the description of the research and previous journal system that will be made discount the advantage that the object used is the city of Samarinda billboard that displays information specific locations of the city of Samarinda reklame web-based in order to provide information for users who want to install billboards.

Table 1. Literature

No	Nama Peneliti	Tahun	Judul Penelitian	Keterangan
1	Rahardjo	2013	Pembuatan Sistem Informasi Geografis (SIG) Pencarian Lokasi Bengkel	Menggunakan bahasa pemrograman PHP framework Code Igniter Google Maps API versi 3, serta database MySQL
2	Masykur	2014	Implementasi Sistem Informasi Geografis Menggunakan Google Maps API dalam Pemetaan Asal Mahasiswa	Menggunakan Google Maps API
3	Aliyah	2014	Sistem Informasi Geografis Berbasis Web Mengenai Penyebaran Fasilitas Pendidikan, Perumahan dan Rumah Sakit di Kota Bekasi	Menggunakan ArcView 3.3
4	Nurdiansyah dan Abdulah	2018	Sistem Informasi Geografis Sekolah Kabupaten Cianjur Berbasis Web	Menggunakan bahasa pemrograman PHP
5	Suryaningsih	2018	Sistem Informasi Geografis Pemetaan Reklame di Kota Samarinda Berbasis Web	

B. Theoretical basis

1) Geographic Location Samarinda

Samarinda city is the capital of the province of East Kalimantan, the whole area of this city directly adjacent to the Regency. Samarinda city has an area covering 718 square kilometers (71,800 hectares). In asronomis, Samarinda is located at the position between 117o03'00 " - 117o18'14 " East longitude and 00o19'02 "-00o42'34 " South Latitude. The total population of the city of Samarinda is equal to 830.676 inhabitants (Indonesia Population Census results in 2014), this makes it most populous city throughout Kalimantan (Anonymous, 2015).

2) Geographic Information Systems (GIS)

Geographic information system (GIS) is a system that is designed to work with data that is spatially or coordinates tereferensi-koordiniat geography. Geographic Information System is a graphical form by using the map as an interface. SIG is composed of the concept of multiple layers (layer) and relationships. SIG basic capabilities that integrate various

operasi database query, analyze, and display it in the form of mapping based on geography (Prahasta, 2009).

Basically, the term geographic information system (GIS) is a combination of three main elements, namely systems, information and geographically, by looking at the elements - constituents then obviously GIS is one of the information system in which more emphasizing geographic information. The term "geographic information" implies information about the places located on the surface of the earth, and information on the particulars (attributes) that are on the earth whose position is given or known. GIS is a formal unity that consists of a variety of physical and logical resources relating to the object - in the face of the earth. The GIS is a software that can be used for entry, storage, manipulation,

Geographic information system is a system (computer based) that is used to store and manipulate geographic information. Geographic information system designed to collect, store, and analyze objects and phenomena, geographical location is an important characteristic or critical to be analyzed. Geographic information system is a computer system that has four of the following capabilities in dealing with the problem of data geographically referenced: (a) inputs, (b) output, (c) data management (storing or retrieval of data), (d) analysis and data manipulation (Prahasta 2005).

3) *understanding Advertising*

Signage is an activity that aims to provide information or give you an idea, goods or services, with a view to attract people to new ideas, goods or services that are informed that (Barata, 1988). Signage is any activity that aims to introduce a product or service or anything else with the intent to attract the attention of the general public (Bannerman, 1990).

Here are the types of billboards we know that:

- a. **Billboard**
Understanding Billboard is a form of outdoor advertising campaign and have a fairly large size. In a true sense the billboard is a poster with a large size and high diletaka certain place that well-traveled. Billboard including outdoor billboard models most widely used. Its growth was quite rapid. Now in the age of the digital era, the billboard was using new technology so that the term is called digital billboards. Construction of a permanent billboard, as a stand-alone installation, attached building with permanent construction.
- b. **Billboard**
In addition to billboards in Indonesia also known billboards, the difference lies in whether or not the place of permanent billboard itself. If the place is the construction of temporary or semi-permanent, then the billboard called billboards. Billboards material can be wood, metal, fabric, fiberglass, and so on. It contained a short-term information about the event (event) activities that are specific or incidental.
- c. **Videotron**
Videotron is full colors LED display capable of displaying text, images or video and animation with all the color index.

4) *Google Maps API (application programming interface)*

API or Application Programming Interface is a set of commands, functions, and protocols that can be used by programmers when building software for a particular operating system. According to Google Maps for the Business Web. Google Maps API is a set of APIs that lets users overlay data on a customized Google Maps. Users can create exciting web and mobile applications with Google's powerful mapping platform including satellite imagery database, street view, elevation profiles, driving directions, a map with a touch of style, demographics, analysis, and extensive.

Google Maps was introduced in February 2005 and is a revolution of how maps on the web, by allowing the user to draw a map so that it can navigate. This map solution at the time was still new and requires a dedicated server. A few moments later, there was a successful hack download Google Maps for use in its own. This makes Google Maps to the conclusion that they need the API and in June 2005, Google Maps API is released publicly (Svennerberg, G. 2010).

5) *XAMPP*

Xampp is an abbreviation of X (four main OS such as Windows, Mac OS, Linux, and Solaris), Apache, MySQL, PHP, and Perl. Xampp is a device that combines three apps into one package, Apache, MySQL and phpMyAdmin. With Xampp work becomes easy because it can install and configure the three applications at once and automatically.

Xampp function itself is a stand-alone server (Localhost), which comprises several programs, among others: the Apache HTTP Server, MySQL database, and penerjamah languages written with PHP and Perl programming language support.

phpMyAdmin is a free software written in the PHP programming language that is used to handle the administration of MySQL over Jagat Jembar Network (World Wide Web). phpMyAdmin MySQL supports a variety of operations, including (managing databases, tables, fields (fields), relationships (relations), indexes, users (users), licenses (permissions), and others). Basically, managing databases with MySQL to be done by typing in commands accordingly (command line) for any particular purpose (Apriyanti, 2015).

6) *Sublime Text*

Sublime Text is an application for code and text editor that can run various operating system platforms using the Python API technology. The creation of this app is inspired by the Vim application, this application sangatlahfleksibel and powerful. The functionality of these applications can use sublimpackages dikembangkandengan. Sublime Text is not open source applications as well as applications that can be used and are free of charge, but some feature functionality development (packages) of this application is the result of the findings and the full support of the community and has a free application licensing.

7) *HTML (Hypertext Markup Language)*

According Hidayatullah and Kawistara (2014) HTML (Hypertext Markup laguage) is the standard language used to display web pages

8) *PHP (PHP: Hypertext Processor)*

PHP is singktan of "PHP: Hypertext Processor", which is the programming language that is widely used for

handling the manufacture and development of a website and can be used in conjunction with HTML. PHP was created by Ramus Lerdorf first time in 1994. At first PHP is "Personal Home Page Tools". Subsequently changed to FI (Forms Interpreter). Since version 3.0, the name of the language was changed to "PHP: Hypertext Preprocessor" by the acronym "PHP".

In June 2004, Zend released PHP 5.0. In this version, the core of the PHP interpreter changes big change. This version also includes a model of object-oriented programming in PHP programming language to address developments in the direction of the object-oriented paradigm.

PHP can be run through an HTML file which is then invoked through a Web browser such as Mozilla Firefox, Netscape or Internet Explorer. Programs written in PHP with a given extensions '.php' (Rasjid, 2014).

9) JavaScripts

JavaScripts a popular scripting language on the internet and can work in most browsers popoler such as Internet Explorer (IE), Mozilla Firefox, Netscape and Opera. Javascript code can be inserted into a web page using the SCRIPT tag (Sunyoto, 2007).

III. RESEARCH METHODS

Before you begin to format your paper, first write and save the content as a separate text file. Complete all content and organizational editing before formatting. Please note AD sections below for more information on proofreading, spelling and grammar.

A. Place and time

This research was conducted at the Department of Public Works and Urban Spatial Samarinda for data retrieval advertisement in 2018.

This study will be conducted in Samarinda, East Kalimantan city as the place to be investigated, This study takes as long as 6 months of the month October 2018 - May 2019 includes the preparation of proposals, data retrieval, application development, and preparation of reports.

B. Tools and Materials

The tools used in this study are included:

1. laptop
2. Software API (application programming interface)
3. PHP
4. HP Vivo Y17
5. XAMPP
6. Sublime Text
7. Google browser

Materials to be used in this study are:

1. Data marker advertisement.

C. Research procedure

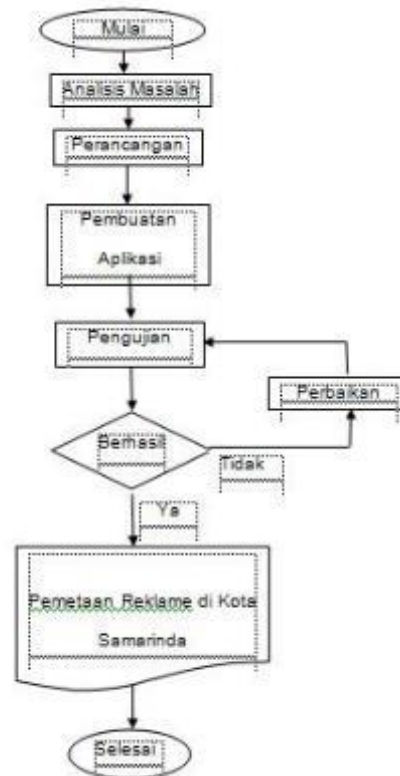


Figure 1 Procedure Research

D. Data analysis

The data analysis explains that the user can start to see the application that contains the location of the billboard, advertisement name and address of the advertisement will appear in each data or markers that appear on the map, can be seen in figure 2.

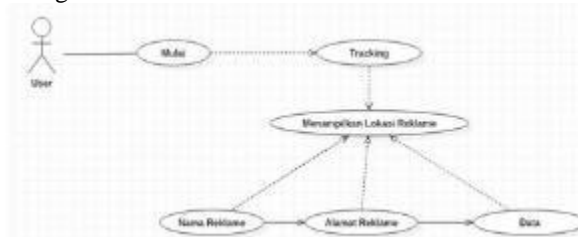


Figure 2 Use Case Analysis of Data

E. Draft User Interface

1. Home page

Mupakan home page home page that displays navigation applications to access various menus provided in the application. The design can be seen in Figure 3 below:



Figure 3 Page Home

2. Design Display Menu Map

On the Menu map will show samarinda city map that contains the data marker billboards which have been determined. Display design can be seen in Figure 4 below:

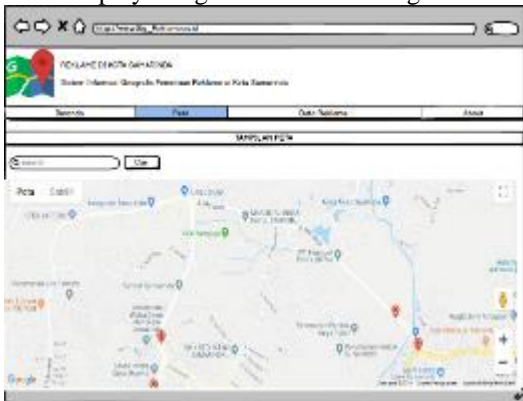


Figure 4 Page Show Map

3. Design Data Menu Display Advertising

On the Data menu display billboards are tables that will display the id latitude, longitude, description, address and category. The design of the data menu display billboard can be seen in Figure 5 below:



Figure 5 Design Data Display Advertising

4. About Menu Display Design

At about the menu display contains information about the program makers. Design about a menu display can be seen in Figure 6 below:



Figure 6 Design Display Menu About

IV. RESULTS AND DISCUSSION

A. Results System Development

1. Database Creation page

The first step in building a geographic information system mapping app advertisement is to install a server application that is using Xampp control panel is installed on the Google Chrome browser. After completing the installation then run the Xampp control panel application. On a system that has built a database that contains one table is tabel_data. Here are the results from the table's creation in Geographic Information Systems Mapping Billboards In Samarinda.

a. Tabel_data

Tabel_data provide information about the data that will be used to display the advertisement information map and detailed information of the location. The information that is on tabel_data form of Id, latitude, longitude, description, address, category of which can be seen in Figure 7 below.

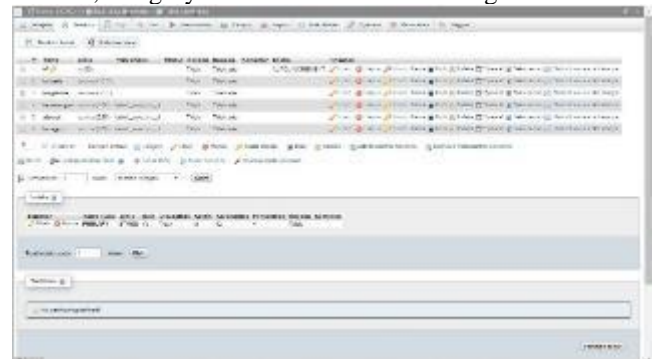


Figure 7 Database

2. Coordinate Data Retrieval Results Advertising In Samarinda

From the research activities that have been implemented. In terms of field measurement results obtained in the form of location coordinate data workshop motorcycle dealer in Samarinda.

The data thus obtained then input into a database and processed directly in the manufacture of the web. The results of the coordinate data input that can be seen in Figure 8 below.

ID	Latitude	Longitude	Description	Address	Category	Input	Edit	Delete	Location
1	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				
2	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				
3	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				
4	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				
5	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				

Figure 8 Data Coordinates

6. Data page Advertising

In the advertisement data page there is a table that contains id, latitude, longitude, description, address and category, and there is input, edit, delete and location details can be seen in Figure 12 below:

a. Data Table Signage

ID	Latitude	Longitude	Description	Address	Category	Input	Edit	Delete	Location
1	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				
2	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				
3	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				
4	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				
5	5.110000	117.120000	Informasi tentang billboard di Samarinda	Jl. Cipto Mangrove Kosambi, Sungai Lele, Samarinda	Billboard				

Picture 1 Data Table Display Advertising

3. Admin Login Page

On the admin login page contained the login button to go to the home page and there is a textbox username and password that can only be filled by the admin can be seen in Figure 9 below:

Selamat Datang di Website Sistem Informasi Geografi Pemetaan Reklame di Kota Samarinda

Silahkan Masukkan Username dan Kata Sandi

username:

password:

Figure 9 Page Login

4. Home page

On page contains information about billboards and other types of billboards in the city of Samarinda. Display home page can be seen in Figure 10 below:



Image 10 Home page

5. Weather Map

On page map contains maps, signage and marker search button to see the data distribution of billboards in the city of Samarinda which can be seen in Figure 11 below:



Figure 11 Weather Map

7. Data Input page

This page is to enter data, the admin must include the location of the billboard is latitude and longitude, and enter a description, address and category billboards after completion admin hit the save button and the data will be signage posted on the map that can be seen in Figure 13 below:

Data Reklame » Tambah Data

ID:

Latitude:

Longitude:

Keterangan:

Alamat:

Kategori:

Foto:

Figure 13 Input Data

8. Maps Edit Data

This page to update the data, the admin can mengudate existing data by entering the location of the billboard is the latitude and longitude as well as enter a description, address and category billboards after completion admin hit the save button and the data will be signage posted on the data billboards can be shown on the image 14 follows:

Data Reklame » Edit Data

ID:

Latitude:

Longitude:

Keterangan:

Alamat:

Kategori:

Foto:

Figure 14 Edit Data

9. *Weather Clear Data*

This page perform the data penhapus billboard that can be seen in Figure 15 below:



Figure 15 Delete Data

10. *Location Details page*

This page shows detailed information about the location of billboards in the city of Samarinda which can be seen in Figure 16 below:



Figure 16 Location Details

11. *About page*

This page contains information program maker biographical data that can be seen in Figure 17 below:



Image 17 Home About

B. *Discussion*

The discussion of the application of geographic information system mapping samarinda billboards in the city has several web-based source code.

1. *source code API KEY*

```
</script>
<script async defer
src="https://maps.googleapis.com/maps/api/js?key=AjzaSyAKH2F9gZMQyATwB
odQsE~uMDfokVCvZw&callback=initMap">
</script>
```

a. Create a table to display the data billboard

```
<?php
    $data
    file_get_contents('http://localhost/Sig_Reklame/ambildata.php');
    $no=1;
    if(json_decode($data,true)){
        $obj = json_decode($data);
        foreach($obj->results as $item){
            ?>
            <tr>
            <td><?php echo $no; ?></td>
            <td><?php echo $item->latitude; ?></td>
            <td><?php echo $item->longitude; ?></td>
            <td><?php echo $item->keterangan; ?></td>
            <td><?php echo $item->alamat; ?></td>
            <td><?php echo $item->kategori; ?></td>
            <td><?php echo $item->harga; ?></td>
            </tr>
        }
    }
    ?>
```

b. Source code to display the map

```
var officeLocations = [
$ Data = file_get_contents ( 'http:
//localhost/Sig_Reklame/ambildata.php');
$ No = 1;
if (json_decode ($ data, true)) {
$ Obj = json_decode ($ data);
foreach ($ obj-> results as $ item) {
?>
[ '<? Php echo $ item-> id?>', '<? Php echo $ item->
latitude?>', '<? Php echo $ item-> longitude?>', '<? Php
echo $ item -> explanation?>', '<? php echo $ item->
address?>', '<? php echo $ item-> category?>' ],
<? Php
}
}
?>
```

C. *Test result*

Table 2. Respondents Testing Results

No	Pertanyaan	Nilai			
		SS	S	KS	TS
1	Apakah Anda tertarik untuk menggunakan SIG Pemetaan Reklame (j).?	(8) 26,67%	(22) 73,33%	(0) 0%	(0) 0%
2	Apakah tampilan aplikasi SIG pemetaan reklame berbasis web ini menarik?	(11) 36,67%	(18) 60%	(1) 3,33%	(0) 0%
3	Apakah SIG Pemetaan Reklame mudah digunakan?	(8) 26,67%	(22) 73,33%	(0) 0%	(0) 0%

No	Pertanyaan	Nilai			
		SS	S	KS	TS
4	Apakah tampilan pada SIG Reklame ini sudah sesuai dengan kebutuhan?	(8) 26,67%	(18) 60%	(4) 13,33%	(0) 0%
5	Apakah SIG pemetaan reklame dapat membantu anda dalam pencarian informasi reklame?	(7) 23,33%	(21) 70%	(2) 6,67%	(0) 0%
6	Apakah letak reklame yang anda pasang sudah strategis?	(9) 30%	(21) 70%	(0) 0%	(0) 0%
Rata-rata		28,33%	67,77%	3,88%	0%

Based on Table 2 states the responder of the test results on the application of geographic information system mapping of billboards in the city web-based samarinda has the highest value of 67.77% with answers agree (S).

V. CONCLUSIONS AND RECOMMENDATIONS

Conclusions from the design and implementation of geographic information system mapping advertisement is as follows:

The system can bring up the map and marker signage and billboards detail information. View maps in the GIS can bring billboard search by category and price per year lease billboards in the city of Samarinda and based on the results of a questionnaire on the application test, the response from users with answers to disagree (s) with the highest grade average of 67.77%. Thus the application is being tested

appropriate and suitable for use in a geographic information system mapping of billboards in the city of Samarinda.

As for suggestions from the author for this system are as follows expected geographic information system mapping of billboards in the city of Samarinda-based web that has been made to do further research to system android and update the location of the newest, geographic information system mapping of billboards in the city samarinda web based These filters can be developed to add a big way in the city of Samarinda and the expected development of this application can provide information about the shortest distance from the user's location.

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