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Implementation of Rest API in Sports Facilities and Infrastructure Finding Application in Yogyakarta City

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Abstract

Yogyakarta is a city that has many sports facilities and types of sports. However, not all sports facilities are known by the people of Yogyakarta, especially for migrants from outside the city. So that a sports venue search mobile application is needed that can provide information about sports facilities, the need for sports facility information that can be accessed whenever and wherever the user is. Based on the above problems, it is proposed to create an android-based nearest sports venue search system. This system determines the location of the nearest facilities and infrastructure from the user's position by calculating the distance from two coordinate points and displayed on google maps and displaying the route to the nearest sports venue from the user. The result of this research is an android-based sports facilities and infrastructure location search application by utilizing GPS geolocation that can detect the coordinates of smartphone users and can display distances, road routes, and location updates. This application uses a data collection method by observation and identifying problems to test applications that are in accordance with community and functional needs. By utilizing Location-Based Services technology, it also increases the convenience of application users who want to exercise. After this sports venue search application is perfect, it will be able to run on the latest android or can run on ios for further features in the development of this application.

Keywords: Google Maps API, Mobile, Location-Based Service, Rest API

I. INTRODUCTION

Yogyakarta is known as the city of students, where there are many overseas students from various regions in Indonesia. The number of students and students in Yogyakarta certainly causes rapid development for the business of building sports facilities such as basketball courts, soccer fields, futsal courts and others. Thus there are many construction of sports facilities in Yogyakarta causing us as migrants confusion in finding the location of the types of sports, information and search for the nearest location of sports facilities. The use of applications with Location Based Services (LBS) systems is very necessary for the wider community, and one form of service is the Google Maps API which uses technology to display the geographic location of a place based on latitude and longitude [1]Along with the rapid development of technology, this Location Based Services (LBS) based sports facility search application service is needed in providing information to its users where this application service can be accessed anytime and anywhere [2].Problems that occur in the community, especially people who come from outside the Yogyakarta area, will have difficulty in finding the location of the nearest sports facilities and infrastructure if they want to exercise.

The desire to exercise will experience obstacles due to ignorance about the location of the sports venue you want to go to. Many studies have applied the Google Maps system as a location service provider and route to the location [3]The public's view of sports venues in Yogyakarta is that there are certainly many sports venues available so people will think that the place is easy to find and access by traveling around which takes a lot of time, but people do not know complete information about the place. In addition, people will have difficulty in finding a route to get to the place with more efficient time and lack of understanding which is quite important because each sports venue has different operating hours and route terrain.

This application is based on LBS (Location Based Service) which is a location-based service that can be accessed through android mobile devices [4] This application is designed and created using Android Studio as software to develop applications on these mobile devices. The application of this application is also very helpful for use among students, students, and workers who often have many activities and also want to do sports activities so as not to waste a lot of time looking for the location of the sports venue they want to go to. Mobile application is a form of software that runs on smartphone systems and the like. mobile applications can be accessed by users if the user has downloaded it and mobile applications are useful for adding functionality to smartphone devices because they have certain functions [5]

Based on this problem, a service application was made that can facilitate the search for accurate sports facilities in Yogyakarta with the title "Implementation of Google Maps API in the application of sports facilities and infrastructure search in the city of Yogyakarta". This application is expected to help students and migrants in Yogyakarta in finding the location of the sports facilities so as not to be confused. There are several studies with themes that discuss similar things. Research from [6] with the title "Vespa Workshop Search Application in Depok City Based on Android with Location-Based Services (LBS) Method". In this study, it is known from the results of the discussion that this application uses the LBS method which is applied to be implemented in determining the accurate location of vespa workshops in the city of Depok. The LBS design uses the Google Maps API designed by the author using javascript programming with android studio which is supported by the android system 4.4 onwards.

II. LITERATURE REVIEW

Based on the exposure of previous research, the urgency of research is centered on the needs of the community in obtaining location-related information that can be accessed using a smartphone and the use of Location-Based Services (LBS) methods that support the resolution of community obstacles that are less familiar with the geographical location of an area that provides accurate location and route information [7]

Research with the title "Utilization of Android-Based Technology in Quick Search for Nearby Tourist Attractions in Karo Regency" by [8] In this study, an application was created that helps every visitor who has difficulty visiting tourist attractions in Karo district because they do not know where the location of the nearest tourist attractions is from the user.

Research with the title "Development of Web-Based Search Applications for Boarding Houses and Rented Houses in Manado" made by [9]. This research is aimed at users in the province of North Sulawesi which has an area of 157.26 km2 and has a population of around 527,007 people who have problems finding boarding houses based on geographical locations that are difficult to reach or do not know about the location of boarding houses and rented houses in Manado.

Research with the title "College Search Application Design" made by [10]. This research aims to assist prospective students in finding information and locations of universities in Yogyakarta. The results obtained from the research are in the form of web design for the admin in managing the application and processing incoming data while the application on android is used by the user to search according to the application function. This application is designed using UML design with Visual Paradigm 15.2 and the development of the application system with the java programming language using the MySQL 5.0.11 database.

Research with the title "Tourist Attraction Search Application Using Location Based Service Method in the Android-Based South Central Timor Regency Area" by [11]. In the context of this research, it makes it easier for users to find tourism locations more effectively by using applications that utilize Location Based Service in South Central Timor.

Research with the title "Hotel Search Application in Jakarta City Based on Android with Location Based Services (LBS) Method Using Android Studio" made by [12]. In this study, it can be concluded that this research aims to help people find accurate locations and information from hotels in Jakarta. This application is designed using the LBS method and java programming which uses a computer device as a server and an android device as a user integrated Global Positioning System (GPS) as a real-time operation.

III. RESEARCH METHOD

In this research presentation using the User Centered Design method which makes an organized and understandable design structure, a detailed research or analysis is needed to obtain research results that are easy to understand [13]. Solving problems that occur during analysis can create a better system [14]. In this research method, the author explains the framework of the research stages carried out, so that it can be a guideline in solving problems that will be faced in making this sports venue search application.

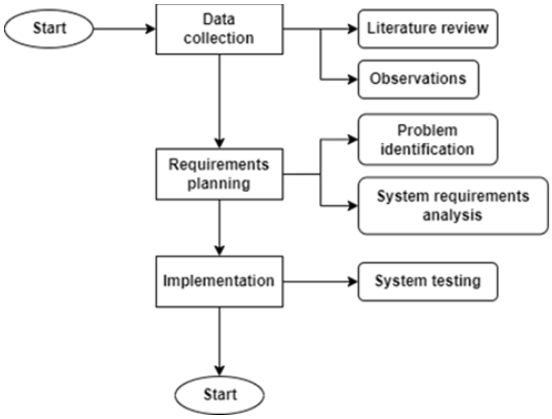

Fig. 1. UCD Method

The data needed are primary data and secondary data [15]. This research is qualitative in nature involving other authors researching similar things so that the author understands the context with the situation being studied [16]. The following are the stages of the research flow carried out so that the author can carry out research activities in a structured manner so that the results of this research are satisfactory as planned. The explanation of the research flow above includes the following aspects:

3.1 Data Collection

In this data collection stage, it begins with conducting a literature study to carry out a comparison between previous journals that discuss the same case about Location-Based Services (LBS) [17]. Further data collection is carried out by observing problems that have the potential to hinder research results.

3.2 Requirements Planning

Planning needs in this chapter are meant to prepare two things, namely problem identification and system requirements analysis. Problem identification discusses solutions to solve existing problems in research. Analysis of system requirements discusses the modeling of application designs made. In this case the modeling used is Unified Modeling Language (UML) modeling. The design also uses GPS technology to track the user's location by utilizing latitude and longitude [18].

a. Use Case Diagram

Use Case Diagram is a description of the expected scenario of interaction between users and the system and the functions of the system being built. This Use Case Diagram itself explains how the role of each actor on data and information in the system [17]. This section describes each explanation of the Use Case Diagram between the admin and application users who are interrelated [19]. This sports venue search mobile application

is intended for the people of Yogyakarta, especially the people who come from outside the city. The following is the Use Case Diagram of the system shown in Figure 2.

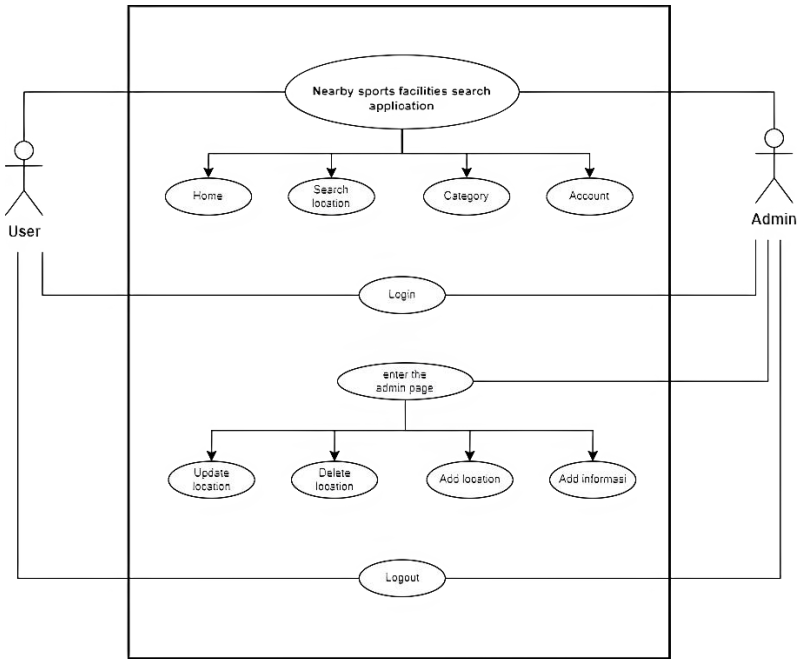

Fig. 2. Use Case Diagram

b. Activity Diagram

The flow of activities from the beginning, process, to the end is described in the Activity Diagram. Activity Diagram is a special diagram state in which most states are actions performed and most transitions are caused by the completion of the previous state. Therefore, Activity Diagrams do not describe the internal behavior of a system in an extra way, but rather describe the processes and paths of activity from the top level in general [20].

Displaying system activity on the profile page carried out by the user then the system displays the request in accordance with the user's request to go to the profile page. The profile page displays data inputted by users through registration such as email, username, number.

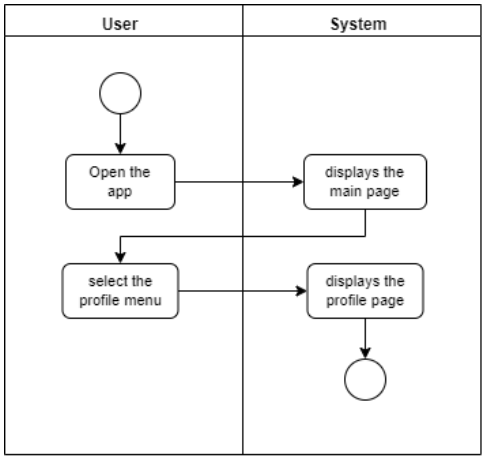

Fig. 3. Activity Diagram Profile Menu

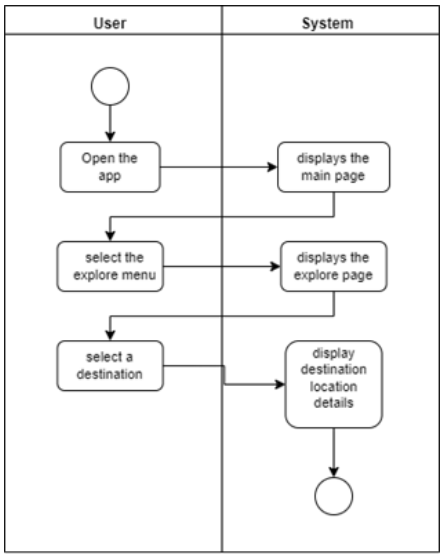

Fig. 4. Activity Diagram Explore Menu

Displays system activity on the explore page carried out by the user then the system displays requests from users to display various kinds of sports venues in Yogyakarta. Then the explore menu displays details of sports venues such as location, admin number, operating hours and routes to the venue.

3.3 Implementation

This implementation stage is a stage that produces system testing of applications designed as a result of the previous stages including system design. After going through various kinds of research and analysis, the design will be implemented.

An overview of the proposed system process from the problem, in the initial process the user logs in using the id and password that has been created by the user in the application. Then the system will store the data. Users can choose a category in finding the location they want to find and then the system will display the location and detailed information related to the sports venue, When the user wants to get directions to the location of the sports venue the system will open a google map and will display a route that leads to where the location is located.

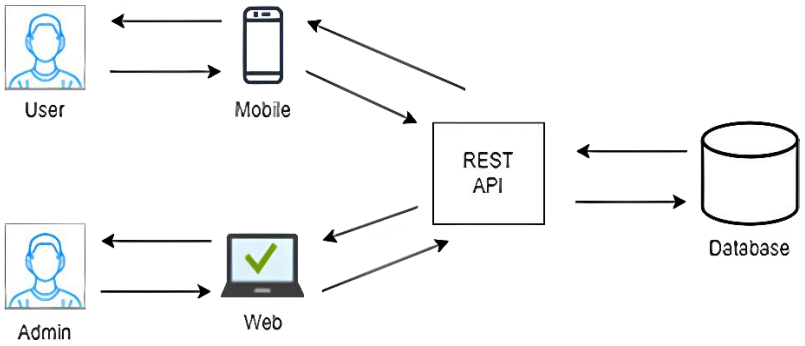

Fig. 5. Analyze the System Used

In the preparation of this sports venue search application design requires sufficient hardware and software to be used in making the application. This hardware is a device used by application compilers in making use of

existing tools. The application is arranged according to the capabilities of the device with the specifications of the table below.

TABLE I
HARDWARE AND SOFTWARE SUPPORT

No	Hardware	Software
1	Laptop Lenovo Ideapad Slim 3	XAMPP
2	Processor AMD ryzen 5 5500U with Radeon Graphics (12CPUs), 2.1GHz	Visual Studio Code
3	RAM 8 GB	Android Studio
4	SSD 522 GB	Browser Chrome
5	AMD VEGA 6	

The software above includes tools used to create application designs in the form of UI displays, servers, and databases. The following is a table that contains the tools used on the device for making the sports facility search application. The database table is used to determine table structures such as field names, data types, field lengths, and field descriptions. This structure is used in creating the database.

a. User Table Database

The user table aims to store user data that is used when the user will log in when registering in the application. This table contains id_user as the primary key, email, phone, password, con_password, location to store user data.

TABLE II
IDENTITY USER DATABASE

No	Field Name	Data Type	Status
1	id_user	Int(11)	*Primary key*
2	email	Varchar(100)	No
3	phone	Varchar(15)	No
4	password	Varchar(50)	No
5	location	Text	No

b. Db_lokasi Table Database

The db_location table aims to store registered location data. This table contains id as the primary key, category as separating the database place, name_place to store the name of the location, address to store the address, region to store sub-district and district data, telephone to store cellphone numbers, and operational to store location operating hours can be seen in Table 4.

TABLE III
IDENTITY LOCATION DATABASE

No	Field Name	Data Type	Status
1	id	int(10)	Primary key
2	kategori	Text	No
3	nama tempat	Varchar(150)	No
4	wilayah	Text	No
5	alamat	Varchar(250)	No
6	telp	Varchar(50)	No
7	operasional	Varchar(150)	No

the following image is the implementation of database identity on the table to my sql:

Fig. 6. Database Implementation on MySQL

IV. RESULTS AND DISCUSSION

4.1 System Testing User

System testing is a test of applications that have been designed to determine the results of the design that has been made and can identify problems that occur. This test displays the running results of the application on a smartphone.

a. Splash Screen Page View

The splash screen page will appear when the application is opened where it will display a splash screen in the form of logo animation and different background colors.

Fig. 7. Splash Screen Page Display

b. Login Page View

The login page is intended for users to input Email and Password in order to enter the dashboard page. The input must be an Email or username and also a password with mixed characters of letters and numbers, if the user enters the wrong email format or an invalid password, a message will appear containing "Login failed", besides that on the Login page there is also a text sign up which functions for registration.

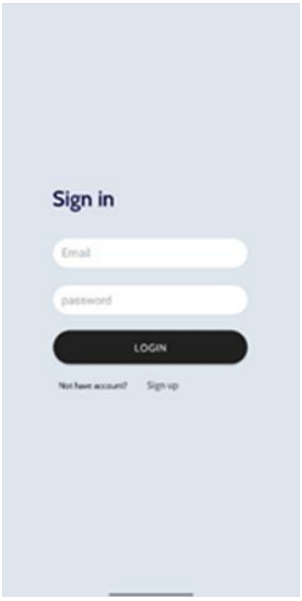

Fig. 8. Login Page Display

c. Register Page View

On the register page the user is asked to fill in the data to create an account, which will later be used to log in on the login page, as well as the login activity, if the user enters the data incorrectly or incompletely then a message will appear requiring the user to fill in all the data completely and correctly, but if the user already has an account then, can directly perform login activities by using the sign in button.

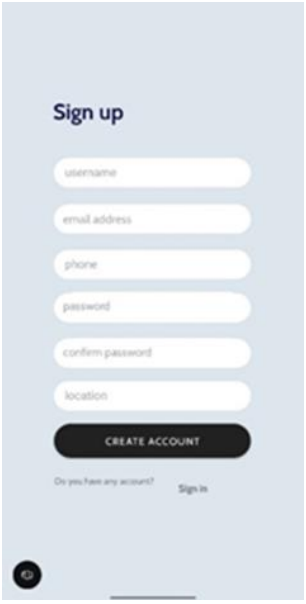

Fig. 9. Register Page Display

d. Home Page View

The dashboard page will appear after the user has successfully performed Login or Register activities. The dashboard page will display 6 menus, namely "futsal page", "gym", "basketball", "soccer", "badminton", "profile", and the "Logout" menu functions when the user wants to log out or change another account.

Fig. 10. Home Page Display

e. Explore Page View by Category

The explore page contains a listview, each photo and name of each tourist spot, each location is equipped with a detail button that will display the place of the sports facility. Users will go to the location details page after pressing the button of one of the categories such as futsal, gym, basketball, soccer, and badminton.

Fig. 11. Explore Page Display

f. Profile Page View

On the account page, after the user has successfully logged in, information such as User Name, Email, Phone Number, location will appear according to the data that has been registered on the Register page. Users can view and change the data that has been listed by pressing the email, or active telephone number. Then for location data following the GPS feature that tracks the user's location.

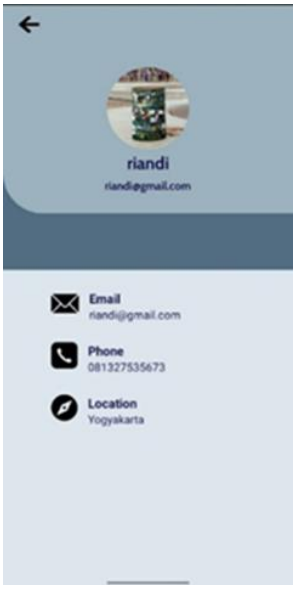

Fig. 12. Profile Page Display

g. Location Details and Maps Page View

The details page will display details related to the tour, this page also features a slide image feature, where users can slide the image to see other images at that location, besides that on the details page there is also a button (Button route) which functions as a map viewer, to go to the location of the destination sports facility. The maps page will display the desired location maps after pressing the route button on the application details.

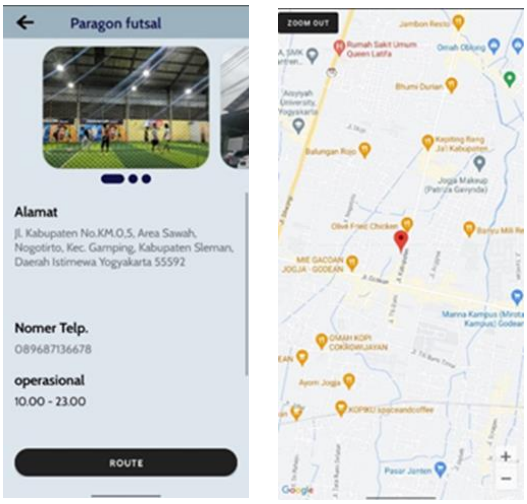

Fig. 13. Location Detail Display and Maps

4.2 System Testing Admin

This test displays the admin interface to manage the location of sports facilities and infrastructure based on updated information in order to maintain the accuracy of information in the application in the form of detailed location information, contact numbers, coordinate points and operating hours.

a. Location Data Input View

This page is used for admins to input location data that they want to add and will later be displayed on the location data page.

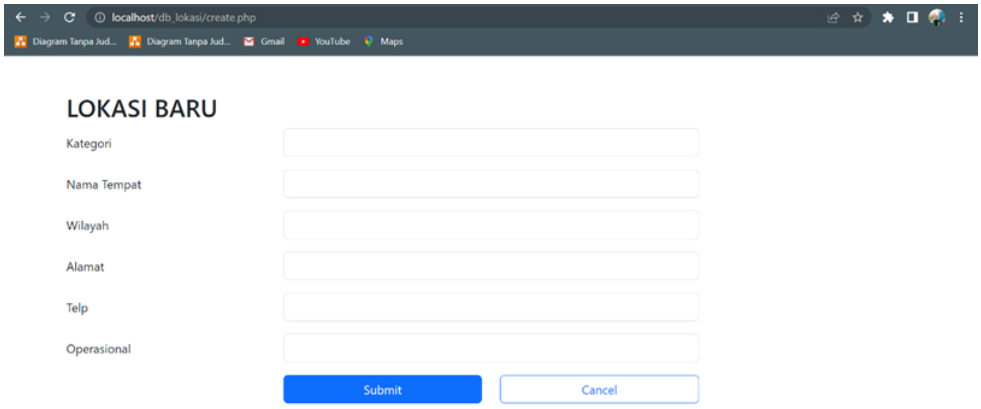

Fig. 14. Location Data Input Display

b. Display of Inputted Location Data

On this page displays the location data that has been inputted as above which will be displayed also on the mobile display.

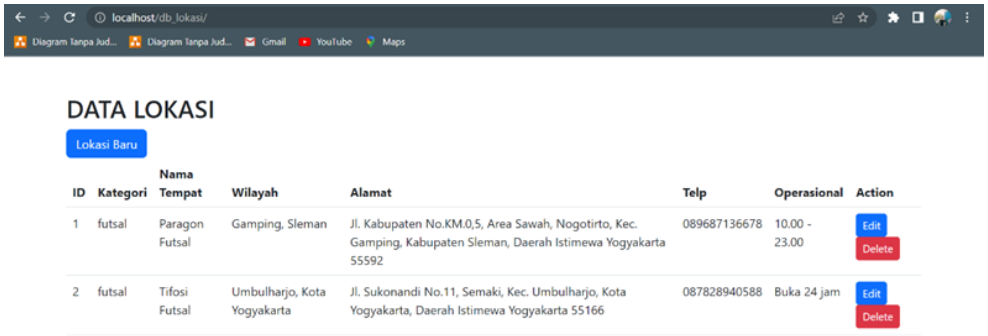

Fig. 15. Inputted Location Data Display

4.3 Result Test

From the results of the application demo screenshot above for the application program created includes a login, register, dashboard, profile, sports venue display, and details of the nearest sports venue. the following table describes the application testing.

TABLE IV
RESULT TEST

No.	Item Testing	Detail Testing	Status
1	Sign in	Input Email	Success
2	Sign in	Input Password	Success
3	Sign in	Enter the main menu	Success
4	Button profile	Enter the profile page	Success
5	Button explore	Enter the explore page	Success
6	Button detail explore	Enter the detail page	Success
7	Button logout	Back to Sign in menu	Success
8	Fitur image slide	Slide image on explore details	Success
9	Sign up	Enter data for Login	Success
10	Button route	Into the Maps	Success
11	Update location admin	Input detail location	Success
12	Read location updated	Read location	Success

V. Conclusion

Based on the results of the research application of the Implementation of the Mobile User Centered Design Method using the Rest API on the Mobile-Based Sports Facilities and Infrastructure Search Application, it can be concluded that this application makes it easier for overseas people to get and know the address, location, and sports venues accurately. Based on the systems and programs that have been built, it makes it easier for overseas communities to find the nearest sports venues to make it more efficient to get to the location, and make it easier for people to exercise at every sports venue in Yogyakarta, with this application the community also becomes easier in determining suitable destinations or those they want to go to, with detailed information such as the latest information and photos about the place of sports facilities and infrastructure. The suggestions that can be conveyed by researchers to develop the application for the better are to add rating features to the application as well as reviews so that the application can sort from the best rating to the lowest rating and make the User Interface even better and a simpler look but easy to use by various groups. Later this application will also be developed multi-platform so that it can run on android and IOS with updated specifications.

REFERENCES

[1] Y. Sari and H. Riyansah, "Aplikasi Tracking Pedagang Keliling Dengan GPS Google Maps API Berbasis Android," Jurnal IKRAITH-INFORMATIKA, vol. 5, no. 3, pp. 178–191, Nov. 2021.
[2] K. A. Yuwamahendra and C. I. Ratnasari, "Penerapan Teknologi Location-Based Services dalam Mobile Application: Suatu Tinjauan Literatur," in AUTOMATA, Yogyakarta: Universitas Islam Indonesia, Jun. 2020, pp. 1–5.
[3] D. Darwis, A. Ferico Octaviansyah, H. Sulistiani, and R. Putra, "APLIKASI SISTEM INFORMASI GEOGRAFIS PENCARIAN PUSKESMAS DI KABUPATEN LAMPUNG TIMUR," Jurnal Komputer dan Informatika, vol. 15, pp. 159–170, 2020.
[4] M. Mammetmyradov, N. Faizah, and L. Koryanto, "Aplikasi Pencarian Showroom Yamaha di Kota Tasikmalaya Berbasis Android Menggunakan Metode Location-Based Service (LBS) dan Framework React Native," Journal Digital Technology Trend, vol. 1, no. 2, pp. 92–98, Dec. 2022, doi: 10.56347/jdtt.v1i2.69.
[5] W. S. L. Nasution, "RANCANG BANGUN APLIKASI PENCARIAN SARANA KEBUGARAN DI KABUPATEN PURWAKARTA MENGGUNAKAN LOCATION BASED SERVICE BERBASIS ANDROID," Forum Ilmiah, vol. 18, no. 1, pp. 1–10, Jan. 2021.
[6] D. Ihtiar, R. R. WP, and N. Faizah, "APLIKASI PENCARIAN BENGKEL VESPA DI KOTA DEPOK BERBASIS ANDROID DENGAN METODE LOCATION-BASED SERVICE (LBS)," Jurnal Indonesia : Manajemen Informatika dan Komunikasi, vol. 3, no. 2, pp. 67–73, 2022.
[7] Mutmainna and A. M. Khair, "RANCANG BANGUN APLIKASI PENCARIAN BENGKEL AKTIF BERBASIS GOOGLE MAPS API DI WILAYAH KOTA MAKASSAR," Jurnal Manajemen Informatika, Sistem Informasi dan Teknologi Komputer, vol. 1, no. 1, pp. 32–42, Dec. 2022.
[8] J. Banjarnahor, S. P. Tamba, and Y. Laia, "Pemafaatan Teknologi Berbasis Aandroid Dalam Pencarian Cepat Tempat Wisata Terdekat Pada Kabupaten Karo," InfoTekJar : Jurnal Nasional Informatika dan Teknologi Jaringan, vol. 5, no. 1, pp. 202–205, Sep. 2020.
[9] A. Q. Suwito, S. Silimang, and A. M. Sambul, "Pengembangan Aplikasi Pencarian Tempat Kos dan Rumah Kontrakan di Manado Berbasis Web," Jurnal Teknik Informatika, vol. 15, no. 3, pp. 231–238, 2020.
[10] M. G. Barek, E. K. Nurwati, and M. Sholeh, "RANCANG BANGUN APLIKASI PENCARIAN PERGURUAN TINGGI," Jurnal SCRIPT, vol. 7, no. 2, pp. 158–166, Dec. 2019.
[11] N. V. Y. R. Bani, "APLIKASI PENCARIAN TEMPAT WISATA MENGGUNAKAN METODE LOCATION BASED SERVICE PADA WILAYAH KABUPATEN TIMOR TENGAH SELATAN BERBASIS ANDROID," Institut Teknologi Nasional Malang, Malang, 2019.
[12] D. R. S. Siregar, L. Koryanto, and N. Faizah, "Aplikasi Pencarian Hotel di Kota Jakarta Berbasis Android dengan Metode Location Based Service (LBS) Menggunakan Android Studio," Computer Journal, vol. 1, no. 1, pp. 64–72, Feb. 2023, doi: 10.58477/cj.v1i1.65.
[13] A. P. Sitorus, N. F. Saragih, and M. Yohanna, "Perancangan Aplikasi Pengelolaan Dana Desa Di Kabupaten Toba Samosir Dengan Metode User Centered Design (UCD) Berbasis Android," Methotika : Jurnal Ilmiah Teknik Informatika, vol. 2, no. 2, pp. 58–69, Oct. 2022.
[14] Y. Afero, "ALGORITMA BEST FIRST SEARCH MENENTUKAN LINTASAN JALUR TERPENDEK PADA KOTA WISATA BUKITTINGGI," JOISIE Journal Of Information System And Informatics Engineering, vol. 5, no. Desember, pp. 138–145, 2021.
[15] J. Simatupang and Muhammad, "RANCANG BANGUN APLIKASI PENGELOLAAN TUGAS AKHIR DENGAN MENERAPKAN PRINSIP-PRINSIP TEKNOLOGI MOBILE," JOISIE Journal Of Information System And Informatics Engineering, vol. 2, no. 2, pp. 38–48, Dec. 2018.
[16] D. P. Sari, "PEMANFAATAN METODE HILL CLIMBING MENCARI JALUR TERPENDEK OBJEK WISATA KABUPATEN LIMA PULUH KOTA," JOISIE Journal Of Information System And Informatics Engineering, vol. 6, no. 1, pp. 32–38, 2022.
[17] A. Syahputra, M. F. Devara, M. Habibi, and H. Asnal, "Sistem informasi geografis pemetaan masjid di desa dayo kabupaten rokan hulu," Jurnal Computer Science and Information Technology (CoSciTech), vol. 3, no. 3, pp. 396–405, Dec. 2022.
[18] Nasron, M. M. Rose, and A. Irma, "Implementasi Aplikasi Berbasis Teknologi IoT pada Perangkat Tracking dan Kendali Kendaraan Bermotor," Jurnal CoSciTech (Computer Science and Information Technology), vol. 1, no. 2, pp. 57–64, Oct. 2020, doi: 10.37859/coscitech.v1i2.2191.
[19] S. Utomo and M. A. Hamdani, "SISTEM INFORMASI GEOGRAFIS (SIG) PARIWISATA KOTA BANDUNG MENGGUNAKAN GOOGLE MAPS API DAN PHP," 2021. [Online]. Available: http://jurnal.unnur.ac.id/index.php/jurnalfiki
[20] P. B. A. A. Putra, V. H. Pranatawijaya, and N. N. K. Sari, "Implementasi Location Based Service Pada Aplikasi Mobile Penyajian Ruang Ujian," JURNAL SAINS DAN INFORMATIKA Research of Science and Informatic, vol. 6, no. 1, pp. 26–30, 2020.