



Design and Build a Web Service for Mobile Ecotourism in the City of Bogor Using the Rest . Method

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Abstract

The tourism sector is one sector that plays an important role in economic growth in Indonesia. Improving services to tourists when traveling with the use of technology is one of the efforts to support the development of tourism in Indonesia. The eCotourism application is a mobile-based application that serves to provide services to tourists such as providing information about tourist locations, lodging locations, culinary locations, and souvenir locations. In addition, in the eCotourism application, several functions can provide services to tourists while traveling, such as a digital guide system using a QR code. However, in the development process, a system is needed that can provide services to the functions and data that exist in the eCotourism application. In this study, the system that will be created is a web service for eCotourism applications where the web service will function as a bridge for the process of exchanging data between eCotourism applications and the database. In addition, the web service that is built is also able to support the functions that exist in the eCotourism application and is multi-platform so that it can be accessed by various application platforms. The architecture used in making the web service is REST (Representational State Transfer Protocol) architecture which uses the HTTP method to process data exchange via URL (Uniform Resource Locator). Making a web service can help eCotourism applications in providing services to tourists when traveling by providing data and existing functions. In addition, making this web service is also able to integrate eCotourism applications with other applications.

Keywords : eCotourism Application, REST, Tourism, Web service

Introduction

Based on Law no. 10 of 2009 the definition of tourism is various forms of tourism activities where these activities are supported by infrastructure and services provided by the community, entrepreneurs, and the government [1]. In order to support the development of the tourism industry to be better and orderly, Government Regulation No. 50 of 2011 was made on RIPPARNAS (Master Plan for National Tourism Development) which regulates tourism including tourist service information and tourism information center [2].

Based on data from the Ministry of Tourism and Creative Economy, the development of the tourism sector managed to add 5.5% to the national GDP in 2019 [3]. The Central Statistics Agency also categorizes the characteristics of tourists based on the destinations visited by tourists. Based on this grouping, one of the areas that are the most visited destinations by tourists on the island of Java is West Java Province [4].

Bogor City is one of the areas in West Java Province. The geographical location of Bogor City is 106°48' east longitude and 6°26' south latitude with an area of 11,850 ha [5]. The initial step that has been taken by the Bogor City government in increasing the tourism sector in Bogor City is to carry out urban planning, both government areas and tourist destination areas [6]. The tourist attractions in the city of Bogor include natural resources, culture, museums, and several historical heritage buildings that are still well-maintained and used today [7].

Currently, if tourists want to find information about tourist locations in the city of Bogor, tourists must search using search engines on the internet or through social media. This is because there is still no special information media capable of providing information and tourism services as well as a tourism information center for tourists, especially in the city of Bogor. The eCotourism application is a mobile application that is able to provide information and services to tourists such as providing routes to tourism locations, information about tourism, and a tourism guide system by scanning a QR code. However, in the development of



eCotourism applications, technology is needed that is able to provide information about tourism data centrally, especially in the city of Bogor. In addition, the technology used must be able to be accessed by various application platforms. One technology that is able to integrate between many applications on various platforms is to use the Application Programming Interface (API).

API is a software that consists of a collection of procedures, functions, and protocols which can make it possible to connect two or more applications simultaneously by providing functions that can be used many times [8]. Representational State Transfer (REST) is an architecture contained in the API that allows communication of data exchange between two or more systems via HTTP requests where the data exchange process uses HTTP methods including GET, POST, PUT, DELETE, which later the request will be received by the user. REST Server via URI [9]. Web service is a software that is able to provide services in the form of data and information exchange or functions that can be accessed by various platforms because it provides response data in JSON (Javascript Object Notation) or XML format [10].

In a study conducted by Eka Budiyanto, he explained that one way to encourage the trade and tourism sector to recover during the pandemic is to develop regional tourism [11]. Utilization of information technology is one of the solutions in the process of developing tourist areas during the pandemic by applying technology to the tourism sector to increase the potential of tourist attractions by presenting a good system that can help tourists when traveling [12]. In a study conducted by Fajar Surahman et al, they used a web service to integrate web-based and android-based applications. The web service is proven to be able to be a solution in processing data transactions between web and android applications [13].

Based on the description above, this research will design and build a web service about tourism location data in the city of Bogor with the REST method. This research is expected to help the application of eCotourism in providing services and information about tourism locations, especially in the city of Bogor. In addition, this research is also expected to be able to build a web service that is able to integrate eCotourism applications with different applications.

Methodology

The research method used adopts the waterfall method, where the process flows through several phases or stages such as data collection, analysis, design, coding, and testing [14]. The research method can be seen in Figure 1

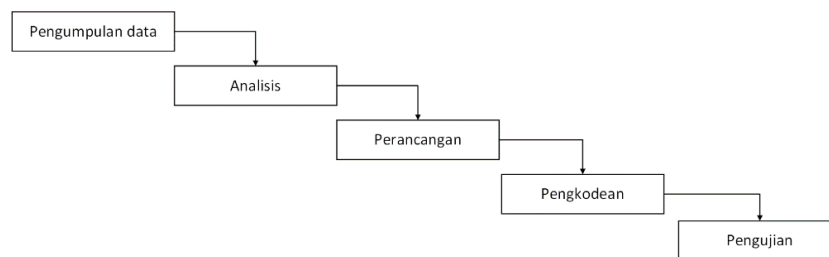


Figure 1. Research Method

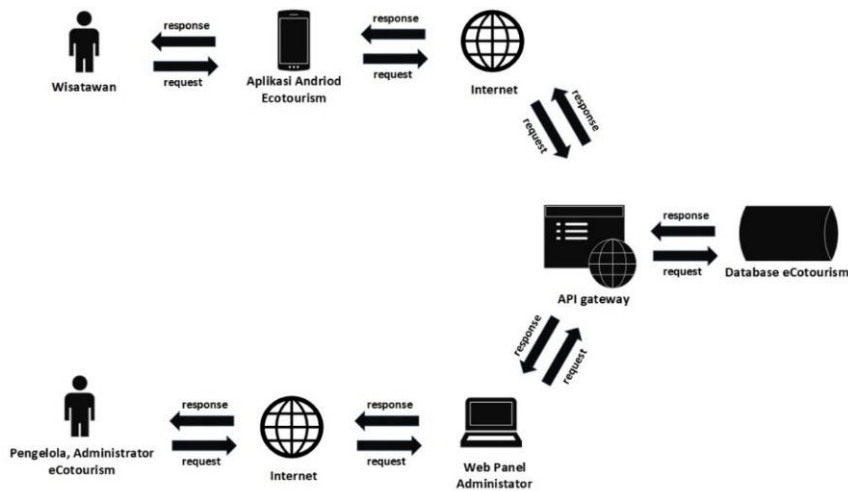
Data collection

The stages of data collection were carried out to complete the relevant information needed in the research. Primary data that can be obtained is the result of interviews from one of the tourism managers in the city of Bogor, namely Devoyage Bogor. While the secondary data used is available data such as journals, articles, publications and data sourced from the Bogor city government website.

System Architecture Analysis

This analysis discusses the design of the web service system architecture that will be made. The system is in the form of an API with web services as software that facilitates interaction and communication between different systems (interoperability). The architecture that will be used in making this API is REST, where the architecture implements two-way communication between the REST server and the REST client. The REST client will make a request to the REST server which will then be received and processed by the REST server. The result of the request will be returned by the REST server in the form of a response in JSON format.

The API gateway acts as a REST server while those that act as REST clients are the eCotourism mobile application and the eCotourism management system. So that every request made will not access the database directly and will be handled by the API gateway. The system architecture that will be made in Figure 2



Gambar 2. Arsitektur Sistem

Analisis Sistem

Sistem yang akan dibuat pada penelitian ini adalah pembuatan API menggunakan arsitektur REST dengan web service sebagai perangkat lunak yang memfasilitasi komunikasi pertukaran data antara mobile application yang digunakan wisatawan dan web application yang digunakan oleh pengelola wisata. Pada Gambar 3 merupakan alur sistem API untuk mobile application eCotourism dan gambar alur sistem API untuk web application.

Pengelola pariwisata hanya bisa mengelola satu lokasi pariwisata, sesuai dengan tempat pariwisata yang dikelolanya. Sehingga hanya akan ada satu akun pengguna untuk setiap lokasi pariwisata. Jika pengelola ingin menambahkan lokasi pariwisata baru, maka pengelola tersebut harus melakukan pendaftaran kembali dengan akun yang berbeda dan kemudian data pariwisata tersebut akan diverifikasi terlebih dahulu oleh administrator. Alur proses verifikasi data pariwisata oleh administrator dapat dilihat pada Gambar 4

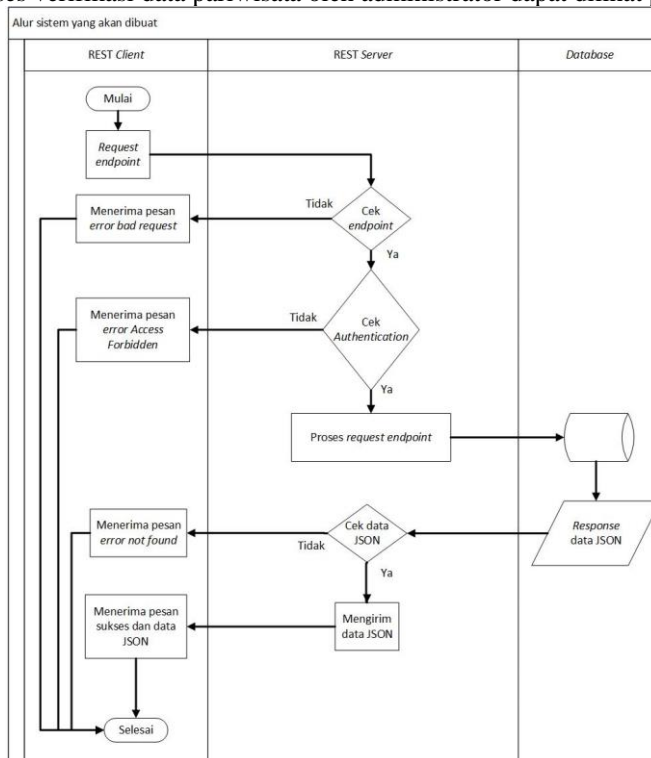
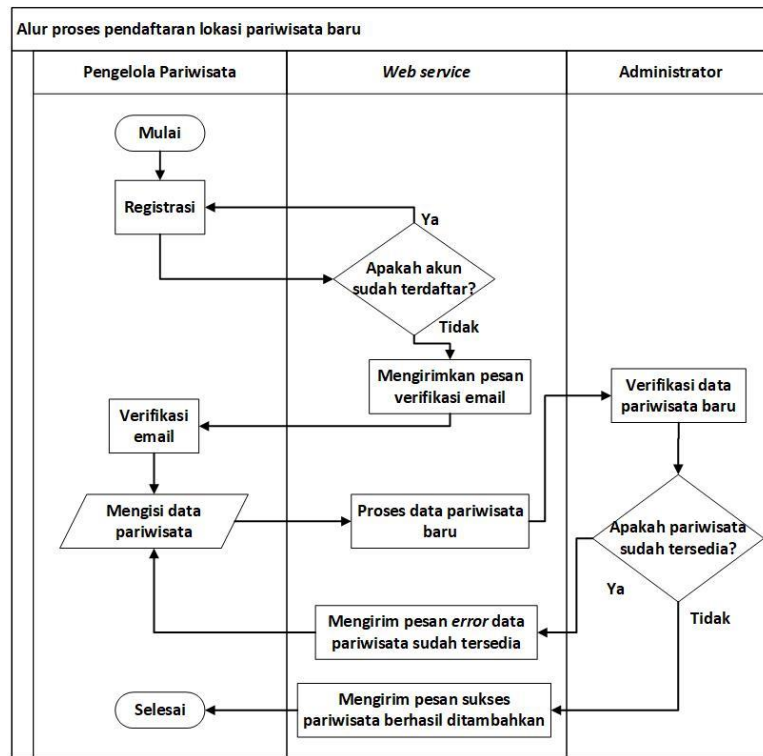


Figure 3. Flow of the System to be Created



Gambar 4. Alur pendaftaran Lokasi Pariwisata baru

Result

Hasil Implementasi

Berdasarkan analisis dan perancangan yang telah dilakukan, maka dibangun sebuah web service untuk transaksi data antara web application dan mobile application eCotourism. Selain itu dibuat juga web application yang akan menjadi sistem manajemen untuk mengelola data wisata, kuliner, penginapan dan data wisata oleh-oleh. Berikut merupakan hasil implementasi dari web service dan web application :

Login wisatawan

Fungsi login merupakan service yang berfungsi sebagai gerbang utama untuk wisatawan untuk masuk kedalam sistem. Deskripsi dari fungsi login wisatawan dapat dilihat pada Tabel 1.

Tabel 1. Service Login Wisatawan

Login Wisatawan	
<i>URL</i>	<i>http://localhost:8000/auth/sign-in/</i>
<i>Method</i>	<i>POST</i>
<i>Parameter</i>	-
<i>Body</i>	<i>email, password</i>

Tourism Module Functions

The tourism module function is a service that is used to manage tourism data which includes tourism data, culinary data, lodging data and souvenir tourism data. In the tourism module there are several functions. Description of the function of this tourism module can be seen in Table 2.

Table 2. Description of the Functions of the Tourism Module

<i>URL</i>	<i>Method</i>	<i>Params</i>	<i>Description</i>
<i>/pariwisata</i>	<i>GET</i>	-	<i>Function to display all tourism data</i>
<i>/pariwisata/:id</i>	<i>GET</i>	<i>id_category_tourism</i>	<i>Function to display tourism data based on id_pariwisata</i>
<i>/pariwisata/search/</i>	<i>GET</i>	<i>travel_name, name_by_by, name, lodging, culinary_name, category, tourism_category id</i>	<i>Function to search tourism data by sending some parameters</i>
<i>/pariwisata/filter</i>	<i>GET</i>	<i>Tourism_category id, category, tourism_category_id, culinary_category_id, category, lodging_id</i>	<i>Function to filter tourism data by sending some parameters</i>
<i>/pariwisata/find</i>	<i>GET</i>	<i>id_categories_tourism, categories</i>	<i>Function to search tourism data by sending some parameters</i>

Testing

The test is carried out using the implementation of the black-box method, by performing a functional validation test of the system on the output of the command given to the web service. The test was carried out using the postman application. Table 3 is the result of testing the web service.

Table 3. Testing Web Services

<i>No</i>	<i>URL</i>	<i>Hasil pengujian</i>	<i>keterangan</i>	<i>Output yang diharapkan</i>	<i>Status</i>
1	http://localhost:8000/auth (POST)	{ "code":200, "data":{}, "success":true, "message": "Berhasil login" }	Login endpoint testing for managers and administrators	Response from web service gives status with code 200 and login message	Succeed
2	http://localhost:8000/auth/sign-in/ (POST)	{ "code":200, "data":{}, "success":true, "message": "Berhasil login" }	Login endpoint testing for travelers	Response dari web service memberikan status dengan code 200 dan pesan login	Succeed

3	http://localhost:8000/auth/registration (POST)	{ "code":200, "data":{}, "success":true, "message": "Registrasi berhasil" }	Endpoint testing for registration	The response from the web service gives a status with code 200 and a successful registration message	Succeed
4	http://localhost:8000/auth/verifikasi (POST)	{ "code":200, "data":{}, "success":true, "message": "Verifikasi berhasil" }	Endpoint testing for email verification by tour manager	The response from the web service gives a status with code 200 and the message is successful	Succeed
5	http://localhost:8000/auth/cekEmail (POST)	{ "code":200, "data":{}, "success":true, "message": "Email belum terdaftar" }	Endpoint testing to check whether the email has been used or not	The response from the web service gives a status with code 200 and the email message has not been registered	Succeed
6	http://localhost:8000/pariwisata (GET)	{"code": 200, "data": [{ }], "success": true, "message": "Sukses" }	Endpoint testing to retrieve all tourism data, including tourism data, lodging data, souvenir data and culinary data	The response from the web service provides status with code 200 and displays all data including tourism, culinary, lodging and souvenir data	Succeed
7	http://localhost:8000/pariwisata/35 (GET)	{ "code": 200, "data": { "id_kategori_pariwisata": 38, "kategori": "Penginapan", "wisata": [], "oleh_oleh": [], "penginapan": [], "kuliner": [] } "success": true, "message": "Sukses" }	Endpoint testing to retrieve tourism data by tourism category id	The response from the web service provides status with code 200 and displays data according to the tourism category id	Succeed
8	http://localhost:8000/wisata/ (GET)	{"code": 200, "data": [{}], "success": true, "message": "Sukses"}	Endpoint testing used to retrieve all travel data	The response from the web service provides status with code 200 and displays all travel data	Succeed
9	http://localhost:8000/wisata/ (GET)	{			Succeed

	<code>lhost:8000 /wisata/W 69 (GET)</code>	<code>“code”: 200, “data”: {}, “success”: true, “message”: “Sukses” }</code>	Testing to retrieve tourist data based on tourist id	<i>The response from the web service provides status with code 200 and displays tourist data based on tourist id</i>	
10	<code>http://loca lhost:8000 /wisata/ (POST)</code>	<code>{ “code”:200, “data”: {}, “success”:true, “message”: “Tambah Data Wisata Berhasil” }</code>	Endpoint testing to add travel data	<i>The response from the web service gives a status with code 200 and the data has been successfully added</i>	Succeed

Conclusion

The conclusion of the research that has been done is that a web service for eCotourism mobile applications has been built using the REST method. The web service that is built is able to provide information and services to tourists regarding tourism locations in the city of Bogor to be processed and displayed on the eCotourism mobile application. The use of the REST method in making web services also allows for the exchange of data between two applications on different platforms.

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