

## Implementation of Web Technology for Tourism and Creative Industry Data Collection

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**Abstract.** This research to provide a system that can facilitate data collection on tourism and creative industries. This research uses a web-based application by utilizing geolocation technology from the google application programming interface. The method implemented in this research uses the software development life cycle waterfall model. The results obtained are that this web-based application can be used online to collect data on creative and tourism industries up to the latitude and longitude coordinates data stored in the database. The data used comes from the Greater Bandung area. The test results obtained a value of 100% of each item. The research results can impact the industrial and tourism sector, especially the stakeholders of related government agencies, so that they can support the acceleration of development, especially in the Greater Bandung area.

### 1. Introduction

The number of tourist destinations needs to be regulated using technology to make it more organized in terms of data. Tourist destinations can increase competitiveness in developing countries [1]. Technology can play an essential role in the tourism destination competitiveness ecosystem [2]. Tourist destination as a tourism product is an integrated unit with other economic products [3]. Destinations are usually focused on growing the number of visitors and their expenses as visitors to a destination [4].

Sometimes different government areas can be a problem when the data collection process of a tourist destination or creative industry. The failure to integrate any data between the creative industry and tourism will hamper the industry's development [5] because, ideally, a tourist spot will have information on the creative industry closest to its location. Creative industry information can make the tourists find products from creative industries that can use as souvenirs [6] near tourism destination. Thus, in addition to increasing tourism sector revenue, SMEs' sector can increase revenues [7].

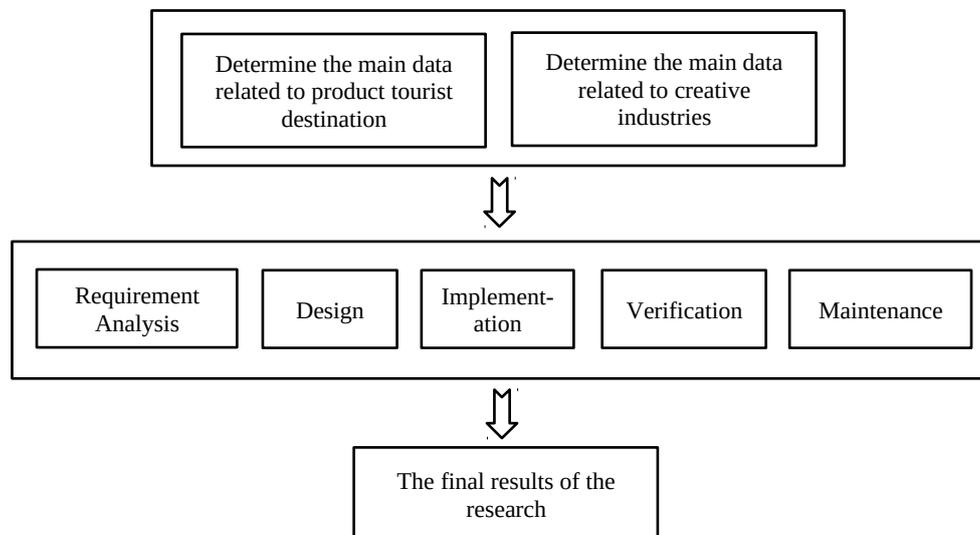
The accuracy of data related to addresses and coordinate positions of tourist attractions and creative industries is difficult to obtain because it must be obtained directly in the field. That requires a large budget for the process of conducting field surveys. One of the indicators that can be used to measure the quality of useful information is accurate [8], relevance [9], and understandability [10]. Tourism is a dynamic activity that involves many people and enlivens various business fields. Tourism is also one of the leading job creators [11]. Oka Yoeti [12] also states that tourism is a conscious human activity

that receives services, in turn, to get pleasure and know something. Thus, when conducting tourism activities, they should also know about attractions, infrastructure, and accessibility.

In this research, a web-based application that can be accessed online was built to collect data on the tourism industry and the creative industry in attractions, infrastructure, and accessibility. The method implemented in this research uses the software development life cycle waterfall model. The stages consist of analysis requirements, design, implementation, verification, and maintenance. The area used as a model in this study is the Greater Bandung area. The purpose of this research is to assist the relevant government agencies, especially the industry and tourism sector, in inputting industrial and tourism data so that they are correctly stored in the database so that in the end, they can support the program to accelerate the development of an area.

## 2. Research Method

The research method used in general consists of determining product tourist destinations and creative industries and the stages of software development. Data collection in this research was carried out by surveying the field and related government agencies from the end of 2019 to October 2020. The framework method of this research can be seen in Figure 1.



**Figure 1.** Stage of research

### 3. Product Tourist Destination and Creative Industries

The basis of tourist destination products consists of destination attractions in attractions, accessibility, and infrastructure. Attractions are the strength of the tourism industry [13]. Attractions are also elements in the environment, which are the primary motivation for tourist visits [14]. Goeldner [15] categorizes attraction into cultural groups, nature, events, recreation, and entertainment.

A destination must have the infrastructure to support visitors to come. Infrastructure relates to the level and quality of facilities and processes required to attract and maintain visits to destinations [16]. Infrastructure is also a component of regional tourism products [17] as well as telecommunications networks, roads [18], accommodation, and supporting facilities [19].

Apart from attractions and infrastructure, in tourist destination products, there is also accessibility. Accessibility includes overall access, capacity, convenience, tourist destination information, ease of combining information with other destinations, and ease of communication.

The stages of determining the primary data related to product tourist destinations are the name of the tour, a photo of the image of the tourist image, the address, the latitude and longitude coordinates, the tour description, the entrance ticket price (weekend and weekday), ticket prices for each facility,

the name of the area, and opening hours and close. Determine the main stages of the data related to the creative industries: SMEs name, description, address, latitude, and longitude coordinates, the owner's name, phone, type of business, number of employees, village, district, years of existence, as well as industrial photos.

#### 4. Software Development

Software development in application data collection on tourist attractions and creative industries using the software development life cycle waterfall model. The stages consist of analysis requirements, design, implementation, verification, and maintenance [20,21].

This stage collects some data and information needed for application development. Data abstraction needs and tourism and industrial data infrastructure are obtained in the requirements stage, and the software and hardware requirements specifications are obtained. The design stage is carried out by designing the web system architecture, display, database, and system functional design. In the design stage, messages are designed as information popups.

The implementation stage is carried out by translating the results of the requirements analysis and design into the application source code to be run. This research is based on a web application that can be accessed online via the internet. During implementation, the source code that has been created is also implemented into the cloud server.

The verification stage is carried out by testing each function of the application that has been built. This verification is needed so that each functional application can run as expected. The final step is to carry out the maintenance process of the application that has been successfully implemented. Periodically the data backup process and maintenance of the hosting server and internet address domain are carried out to be accessed online.

#### 5. Final Research Results

In this stage, final observations are made based on the results of testing and other stages that have been carried out to obtain whether the objectives of the research can be achieved. The results obtained will determine further research.

### 6. Result and Discussion

#### 7. Data tourist and creative industries

This research has obtained data from the industry and tourism offices in the Greater Bandung area. It consists of the City of Bandung, Bandung Regency, West Bandung Regency, Cimahi City, and Sumedang Regency. Until this research was conducted, tourism data that had been successfully entered into the database totaled 159 tourist attractions, and there were 69 data on creative industries recorded. However, specifically for industrial data, it can increase along with the independent addition feature by creative industry entrepreneurs into the application.

#### 8. Specifications for hardware and software requirements

The hardware devices used when building and testing can be seen in Table 1.

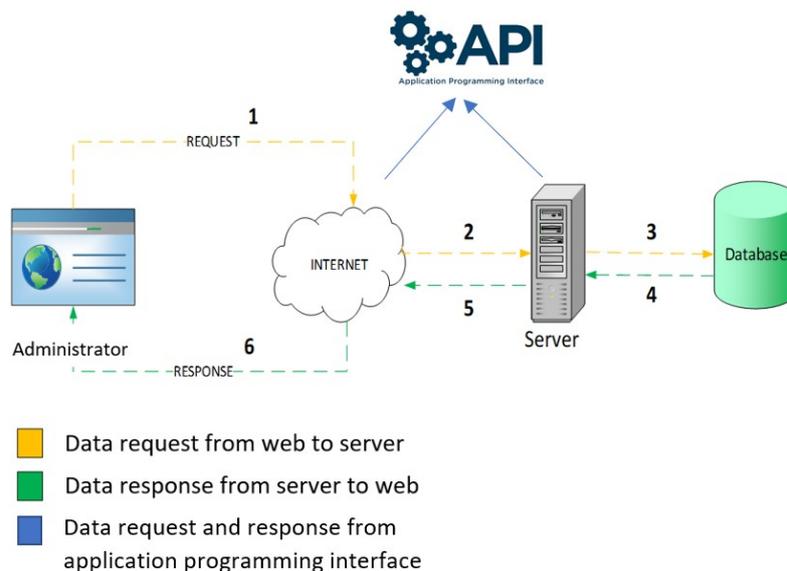
**Table 1.** Hardware and Software Spesification

Device Type	Specification
Processor	Intel Pentium Dual Core 2.2 Ghz
Space hardisk	320 GB
RAM	4 GB
Operating system	Windows 7 64 bit version
API and browser	Google Cloud and Chrome
cPanel version	80.0 (build 23)
PHP and apache	7.3 and 2.4.39

Based on the specifications in Table 1, it can be seen that this application does not really require high hardware when building applications or testing.

### 9. System Architecture Design

In this web system, there is one user, namely the administrator. Administrators have to process data used in applications. This web system architecture will describe how the software interacts with the web subsystem. The system architecture design can be seen in the following Figure 2.



**Figure 2.** System architecture of the application

The flow of the web process is :

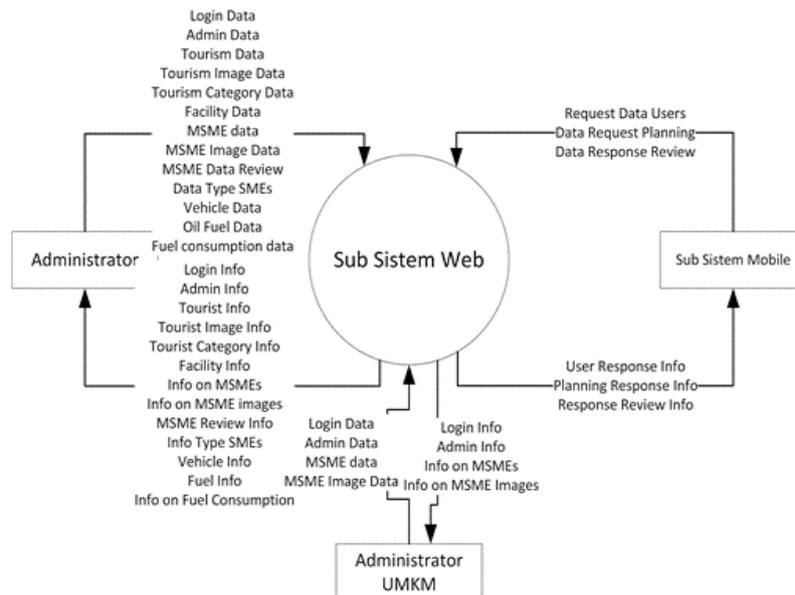
1. On the admin, the administrator makes requests to the internet network before connecting to the server.
2. Then, the client makes a request through the internet network to the server.
3. The server receives requests and requests data on the database.
4. Furthermore, the database will serve requests and send replies to requests through the server.
5. The server sends a reply the response via the internet network.
6. Administrator page receives a reply to a request from the server sent via the internet network.
7. Application programming interface provide web technology for automatic data

### 10. Design of System Diagram

An overview of the whole system, both its input-output, can be seen in the diagram model, as shown in Figure 3. Users who can use this application system are modeled into two, namely administrators and MSME administrators. An administrator has the characteristics of being able to operate a computer well and can process databases. An MSME administrator must be able to account for the proposed MSME data to the system.

An MSME administrator can approve several request data that have been inputted by the public to be stored in the database. The creative industry data in this application does not always come from the

administrator's input only, but can also come from the creative industry data registered by the public after registering.

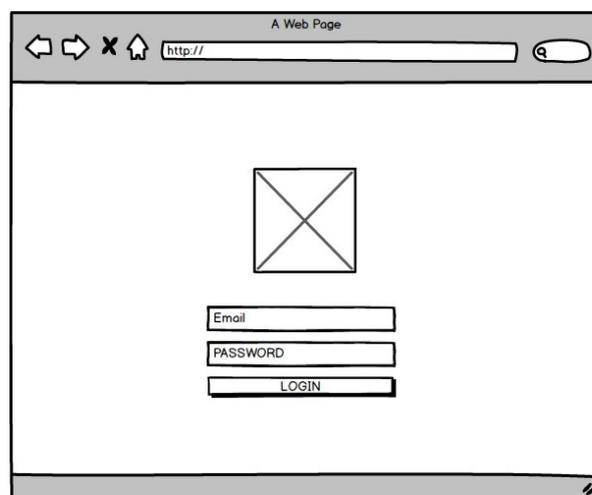


**Figure 3.** Model of the entire system diagram

### 11. Model Display of Website Application

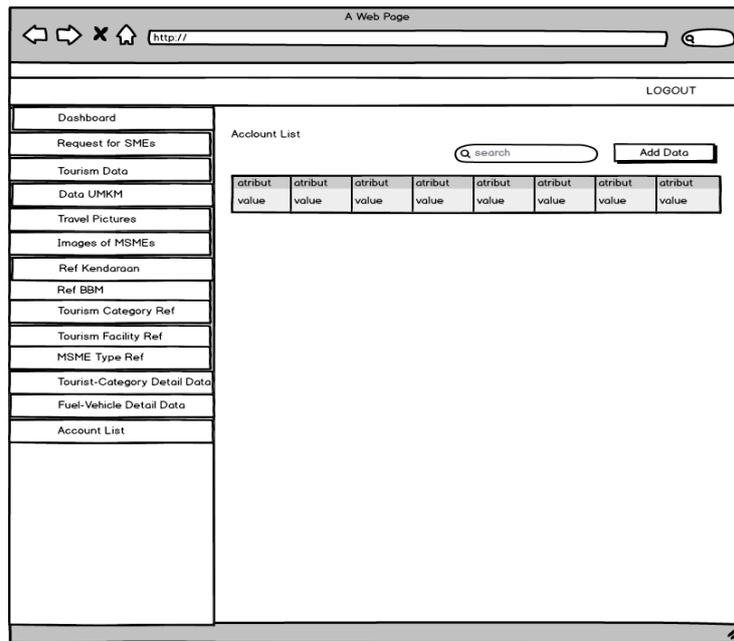
The web subsystem interface design aims to describe the interface in the web application; in this case, the administrator will use the system. This subsystem interface design focuses on how the interaction of each component in the interface.

The login interface design describes the appearance of the login page on the web subsystem, namely the android application that the user will use. The login interface can be seen in the following Figure 4.



**Figure 4.** Model for the administrator website login

The display model for the administrator website in this research show in Figure 5.



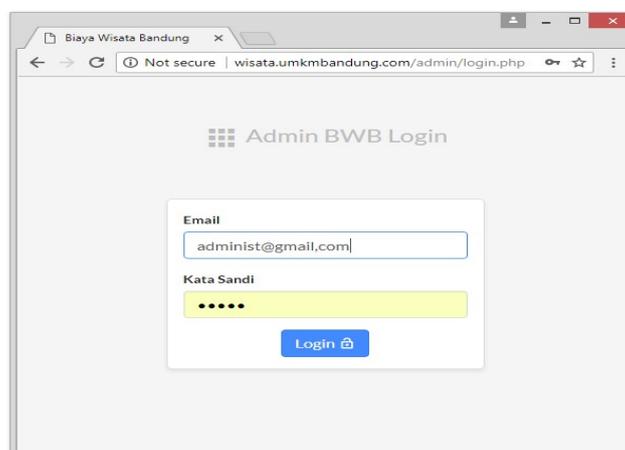
**Figure 5.** Model for the administrator dashboard website

On the website administrator page that is accessed after logging in, some of the menus contained therein are the dashboard menu, requests for SMEs, tourism data, travel pictures, images of SMEs, ref BBM, ref vehicles, tourism category ref, tourism facility ref, tourist category detail data, and account list data which contains the list of users who have registered for an account in this application.

### 12. Implementation Result

This application can be accessed online via the URL address <http://wisata.umkmbandung.com/admin/login.php> in the address box of the browser used.

The application login page's initial view of entering as an administrator can see in Figure 6.



**Figure 6.** Administrator login page

If there are no errors in the login field, the administrator dashboard page will be displayed. The display can see in Figure 7.

The screenshot shows a web browser window with the URL `wisata.umkmbandung.com/admin/2data_wisata.php`. The page title is "Data Wisata". Below the title, there are controls for "Tampil" (set to 10), "Baris mulai" (set to 11), a search bar, and a "+ Data Wisata" button. The main content is a table with the following data:

No	Nama Wisata	Photo Wisata	Harga Tiket	Nama Daerah	Jam Buka Weekdays	Jam Buka Weekend	Action
11	Bandung Indah Waterpark		15000	Kota Bandung	08.00-18.00	08.00-18.00	
12	Barusen Hills		20000	Kabupaten Bandung	08.00-17.00	08.00-17.00	
13	Batu Agung		5000	Kab Sumedang	08.00 - 17.00	08.00 - 17.00	
14	Batu Kuda		5000	Kabupaten Bandung	08.00-18.00	08.00-18.00	
15	Bukit Jamur Rancabolang Ciwidey		5000	Kabupaten Bandung	08.00-17.00	08.00-17.00	

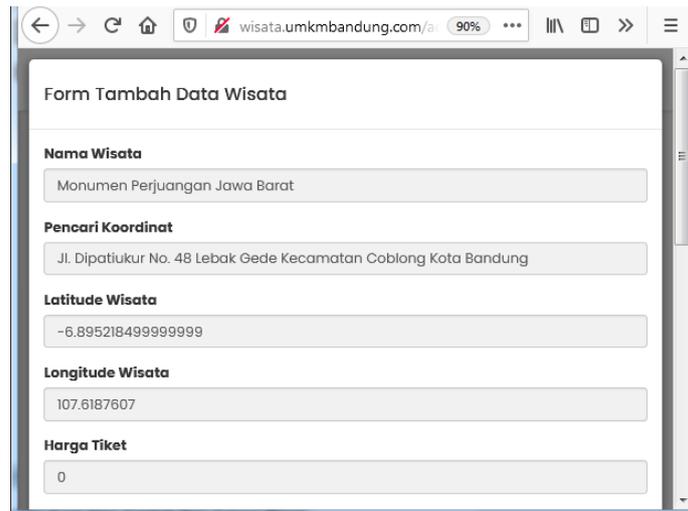
**Figure 7.** Administrator dashboard page

The menu on the administrator dashboard page can be seen in Figure 8.



**Figure 8.** Administrator menu

The use of web technology in this research is when getting the latitude and longitude coordinates of the address of tourist attractions and creative industry places, it is automatically obtained by typing the complete address by the administrator. As shown in Figure 9, when the administrator types the address in the coordinate finder section, the application will immediately get the latitude and longitude of the address.



**Figure 9.** Technology of web implementation in searching coordinate

The syntax used to get coordinates automatically is as follows:

```
function ubahAlamat(){

    var ubahAlamat = document.getElementById("ubahAlamat");
    //console.log(ubahAlamat.value.toString());

    var streetname = [];

    var googleGeocoder = new GeocoderJS.createGeocoder({'provider': 'google', 'apiKey' :
API_KEY_GMAP.KEY});
    googleGeocoder.geocode(ubahAlamat.value.toString(), function(result) {
        var json_resp = {"listObj": $.parseJSON(JSON.stringify(result))};
        console.log(json_resp);
        /* for(i=0;i<=json_resp.listObj.length;i++){
            var output = json_resp.listObj[i].streetName;
            output += ' '+json_resp.listObj[i].streetNumber;
            output += ' '+json_resp.listObj[i].region;
            console.log(output);
            streetname.push(output)
        }
        var countries = ["Afghanistan","Albania","Algeria"];
        autocomplete(ubahAlamat, countries);*/

        $('#lat_wisata').val(json_resp.listObj[0].latitude);
        $('#lng_wisata').val(json_resp.listObj[0].longitude);
    });
}
```

### 3.7 Verification and testing

To test the application is functioning, and as expected, verification and functional testing are carried out in BlackBox. Testing is carried out repeatedly to ensure that each test item is not missed [22]. Figure 10 shows documentation when performing verification and testing.



**Figure 10.** Documentation when verification and testing

The results of verification and testing can be seen in Table 2.

**Table 2.** Verification and testing result

Testing Items	Verification Result
Global Administrator Login	Successfully
Tourism Data Processing	Successfully
Tourism Image Data Processing	Successfully
MSME Data Processing	Successfully
MSME Image Processing	Successfully
Vehicle Reference Data Processing	Successfully
Fuel Reference Data Processing	Successfully
Tourism Category Reference Data Processing	Successfully
Tourism Facility Reference Data Processing	Successfully
MSME Type Reference Data Processing	Successfully
Tourism Category Detail Data Processing	Successfully
Detailed Data Processing of Vehicle Fuel	Successfully
User Data Processing	Successfully
MSME Administrator Login Process	Successfully
Profile Data Editing Process	Successfully
UMKM Data Request Process	Successfully

Based on the testing results in Table 2, the total acceptances from 16 test items were found to be 100% successful and as expected. This research has created an application that can digitize tourism data and industrial premises to be appropriately stored in the database. Administrators can easily input tourism data and creative industries in attractions, facilities and infrastructure, and accessibility.

The results of the testing carried out by BlackBox were also found to be 100% functional and could run according to initial expectations. This study's results can undoubtedly impact the industrial and tourism sector, especially the stakeholders of the relevant government agencies, who become

application administrators to support the accelerated development program, especially in the Greater Bandung area.

With the existence of a web application for tourism data collection and creative industry, of course, it can be used as follow-up research to develop it into a geographic information system application for tourism mapping and creative industries [23], or it can also be taken into consideration when developing a recommendation system [24].

#### 14. Conclusion

Tourism and creative industry data are needed for government and society. The application of this research results can help the government manage and store the data correctly in a computerized way. This application can also be implemented into further research to obtain a recommendation system displayed in the form of a geographic information system or a dashboard information system.

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