

Concept And Implementation of Tourism Information System in Wasur National Park based on Android

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Abstract—Wasur National Park is located in the southeastern part of Papua island within the administrative area of Merauke Regency, Papua Province. Geographically, Wasur National Park is located between the coordinates of 140°27' – 141°2' East Longitude and 8°5' – 9°7' South Latitude. The boundaries of the area are connected with these lines such as the east is bordered by Tonda Wildlife Reserve in Papua New Guinea, the west is bordered by Merauke City, the south is bordered by Arafura Sea, the north is bordered by Maro river area. This area is one of the important wetland ecosystems in Indonesia. Wasur National Park is a living environment of various types of organisms that are protected by the government, and also as an attractive tourist spot.

The development of tourism objects in Wasur National Park area is very limited both in terms of funding and promotion of visits. In the context of developing tourism promotion, officers in Wasur National Park need to identify visitors who cross Wasur National Park area, in addition if there is damage to Wasur National Park area, Wasur National Park Officers will find it easier to investigate. The development of tourism promotion is done by designing an application system. The application concept is made with reference to the development of framework tourism information system. Application facilities include visitor registration information, the location of Wasur National Park area, information on road access to the tourist attractions which are made in form of mobile-based with Android operating system. The system testing method uses blackbox, user satisfaction testing uses a questionnaire with Likert scale method and the application which is used to create the system is android studio and creating a database by using firebase.

The application of tourism information system for Wasur National Park object has been successful in assisting officers and visitors in registering and collecting data, according to the results of questionnaire testing by using Likert scale and the result is in 84% strongly agree. This proves that the system created is successful in accordance with the needs of the user.

Keywords: Information system, Tourist, Wasur National Park, Android.

I. INTRODUCTION

Indonesia has a diversity of tourist attractions throughout its territory. National parks in Indonesia are a form of nature conservation that have been implemented at the third event of World National Park Congress in Bali which was held on the 11 - 22 of October 1982. The initial formation began with the first five national parks and they are such as Gunung Gede Pangrango, Komodo, Ujung Kulon, Mount Leuser and Kerinci Seblat. The establishment of a national park is intended to preserve nature which is protected by the law concerning in Conservation of Biological Natural Resources and their Ecosystems. In addition, the interest of indigenous peoples in the management of protected areas was expressly established at the fifth WPC in Durban (South Africa) on 8-17 September 2003[1]. The establishment of these five national parks has become a pioneer in the real form of ecosystem conservation in Indonesia.

Papua Province with the largest forest in Indonesia and Merauke Regency are part of it with a forest area reaching 95.3% of the total area, this vast natural heritage is a capital that must be maintained, but there are many factors which become problems in efforts to preserve this forest. .

Merauke Regency is located in the easternmost part of the archipelago and it is one of 29 regencies/cities in Papua Province. This district is directly adjacent to the State of Papua New Guinea which is located between 137° – 141° east longitude and 5° 00'9 00' south latitude with an area of 45.071 km² that has very good natural potential with forest area reaching ± 40,5 million Ha, in which there is a heritage nature in the form of National Parks which are the living environment of various individual organisms of various types. Various variations of the existing population create the diversity that makes the ecosystem in this National Park included as a natural heritage and must be preserved.

Wasur National Park is one of the tourism objects in the form of a national park which is located in Papua Province, Merauke Regency. Various variations of the existing population form diversity and make the ecosystem in Wasur

National Park a natural heritage that must always be protected and preserved. The government has designated 527 conservation areas with an area of 27.190.992,91 hectares. Wasur National Park is an asset for natural stability from all social interactions of the surrounding community, and the current impact of Wasur National Park is getting threats that disrupt the life of the ecosystem in it, including frequent felling of trees, hunting for animals protected by the government and excavation of sand in the area. Those cases are caused by there is no any reporting process to officers when visitors enter or leave after visiting Wasur National Park, so that monitoring efforts for visitors who come cannot be known[2], and this case will be a problem in the future.

Based on law number 41 of 1999 concerning Forestry and Government Regulation number 68 of 1998 concerning Nature Reserve Areas and Nature Conservation Areas, an area is designated as a national park area if it can complete the following criteria, such as: a) The designated area has a sufficient area to ensure the continuity of natural ecological processes; b) Having unique and unique natural resources in the form of plant and animal species and their ecosystems as well as natural phenomena that are still intact and natural; c) Have one or several ecosystems that are still intact; d) Has natural and natural conditions to be developed as nature tourism; e) It is an area that can be divided into core zones, utilization zones, jungle zones and other zones which due to considerations of the interests of area rehabilitation, dependence of residents around the area, and in the context of supporting efforts to conserve biological natural resources and their ecosystems, can be designated as separate zones. [3], this zone division aims to facilitate the process of area classification.

Problems that occur in the management of national parks include ecosystem disturbances that can damage the ongoing ecological processes, uncontrolled and undetected illegal logging of trees, hunting of protected animals, and the others. For this reason, in order to prevent potential disturbances that are considered destructive, there must be a clear prevention system.

Another problem as one of the national tourist destinations of Wasur National Park should have clear information about tourist attraction facilities, tourist accommodation, travel information, connectivity with other tourist objects, this will certainly be an attraction for domestic and foreign tourists. Various kinds of problems that appear need a solution in their handling. Therefore, in this study offers solutions to problems made from the point of view of computer science and information technology

II. LITERATURE REVIEW

A tourism information system is needed as a travel guide. The tourism information system in its development experienced several phases of change with the aim of completing the facilities on the old system in accordance with the development of the needs of the new system. Among other things, navigation of tourist objects, decision support systems for tourists, classification of objects offered, travel planning and surveys of tourist preferences in tourist objects.

Several studies related to tourism information systems have been conducted, for example.

Research which was conducted by Sanjaya *et al* (2018) developed an Android-based tourism information system, the research location is in Palembang City, South Sumatra, Indonesia. Android-based application development uses Java Android programming language and is designed using RUP (*Rational Unified Process*). The focus of system development is on the geographical application of tourist guides in the city of Palembang which contains the things such as a list of tourist attractions, a list of public places, a list of transportation, a list of culinary places and also other features that will help tourists to find the most effective and efficient tourist destinations [3]. This is different from the research conducted by Hapsari *et al* (2018) which is located in Surabaya, Indonesia. The development of the tourism system has a focus on surveys conducted through a connected system using the *smart city* concept. The survey was conducted based on the level of satisfaction with the recommendations of tourist attractions that have been visited by tourists with various facilities available at the object. Development of an android-based system while ranking uses *TOPSIS* method as decision support [4]. Furthermore, research conducted by Anggaeni *et al* (2018) focuses on information on nearby tourist objects in the province of Lampung, Sumatra, Indonesia. Research based on *e-tourism* with the calculation of the starting node and the end node as a destination by calculating the shortest distance [5].

Another research by Nugraha dan Alimudin (2020) is developing a mobile-based application with the aim of being a tourist guide application in Pekan Baru area, Indonesia. The system designed uses GPS to locate the user's starting point and provide information on tourist attractions, hotels, restaurants and shopping effectively. The technique used to obtain recommendations uses *K-Nearest-Neighbour* (KNN) algorithm to determine the closest place [6]. In addition, researchers Malciené dan Skauroné (2019) conducted research on the functionality of a tourism information system that contains information on hotels, trips, and the attraction of recreational products. In this case, the application is used to maintain good communication between managers and tourists, build positive relationships and consolidate the surrounding community. The main goal is to create an attachment between tourists and tourist objects through the application created. The technical application is to conduct a survey through the system on the completeness of reservation facilities, navigation, road network, ease of payment and so on [7]. For this reason, with various characteristics of tourist objects, it is necessary to develop a system that can be adapted to the needs of the existing system facilities. In this study, the development of the system focuses on several stages such as the initial stage is the development of the system with tourist visit reports, the second stage of navigation instructions for tourist objects, the third phase of accommodation information for tourist attractions. The initial stage of system development is in the report of tourist visits to the Wasur National Park object, Papua, Indonesia.

III. RESEARCH METHOD

According to the design scheme of tourism information system (F. Hou and X. Du, 2013), efficient tourism information system design can use the following standards[8]:

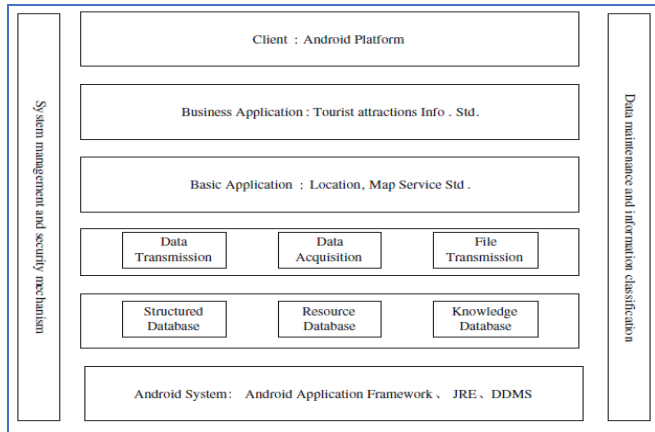


Fig. 1. Architecture of Tourism Information System

Tourism information system which is designed in form of e-tourism platform with 6 layers of development system are such as: 1)Android Application Framework, 2) Structured Database and Knowledge Database, 3)Transmission Data and Acquisition Data, 4)Basic Application (Location, Map Service) dan 5) Business Application (Tourism Attraction Info).

1. The development of an effective tourism information system is carried out by looking at the architecture of international technological developments by applying various new technologies to the system's products to be effective. The development and application of the new technology is measured by technical indicators as an effort to achieve and development must be consistent in accordance with national standards, industry standards and technical specifications.
2. [Stable].The development of the main information system can be ensured that the platform has good system scalability, and it means that the system implementation is more adaptable to the developments and changes in the future.
3. [Practical]. Convenient and flexible user interface facilities as well as additional mapping features. Compatible with different types of data for sharing and processing data. The interface is able to handle the flexibility of increasing system security and can facilitate data access even with other systems.
4. [Measurable]. Providing a complete indicator to test the system starting from the architecture, system functions and applications. Has a complete error handling mechanism, access log, database and system recovery.

Architecture System Development

The system was developed in three steps, such as: 1)Sufficient Spatial Data and Attribute Datat, 2)GIS Database Development by using *Firestore Cloud* and 3)Database of Geographic *Information System*. The detail of the system development architecture can be seen in Figure 2.

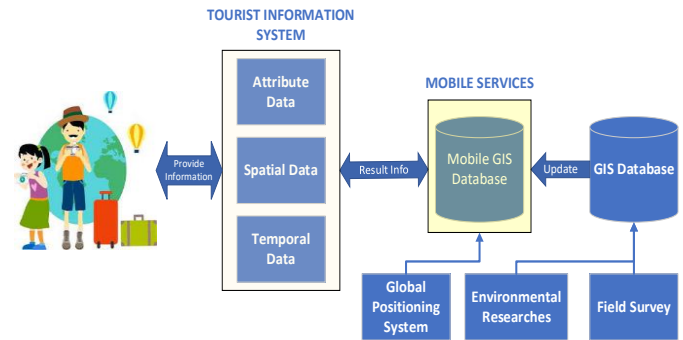


Fig. 2. Tourism Information System Architecture

The concept of tourism information system architecture which was developed requires attribute data/non-spatial data, spatial data and temporal data based on a certain period of time. The adequacy of this data is needed to produce visuals of tourist objects in the form of regional mapping. In order to obtain spatial data that has a high level of accuracy, a GPS (*Global Positioning System*) tool is needed so that the coordinates obtained are more precise. In addition, regional/environmental research is also needed to provide complete spatial information in the form of attribute data. Next is a location survey to see the condition of the object directly so that alternative ideas emerge that can be accommodated in the form of an application.

IV. RESEARCH STEP

A diagram is needed to facilitate the flow of research activities. Diagram made can be seen in Figure 3. The details of the research steps are as follows: 1) Pre-Processing of Initial Research Data; 2) Spatial and Non-Spatial Data Integration of Wasur National Tourism Park Objects; and 3) Visualization of Wasur National Park Tourism Map Results.

Analysis on Functional Needs

Functional Requirements are requirements that contain what processes / services the system must provide later, including how the system must react to certain inputs and how the system behaves in certain situations. Functional Requirements depend on the type of software, system users, and the type of system where the software is used. The following are functional requirements in this information system:

1. The system can register an account through *login*.
2. The system can accept *username* dan *password* input.
3. The system can accept the input of visitor biodata.
4. The system can provide information about the inputted data.
5. The system can edit the information of data change.

Data Needs

The data needs in this study are in the form of tourist visitor data samples in the form of numbers in tables, spatial data for Wasur National Park area and non-spatial spatial data.

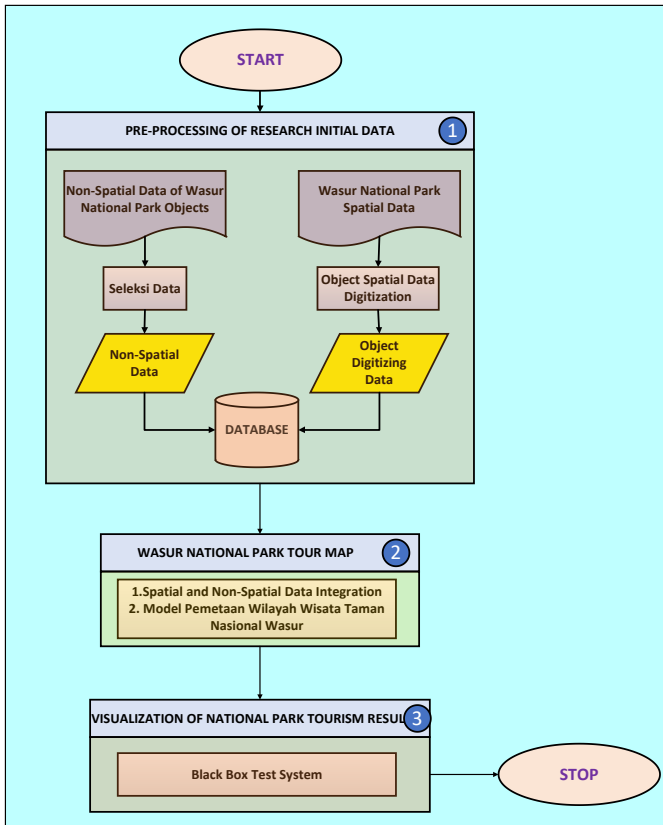


Fig. 3. The Research steps of Tourism Information System in Wasur National Park.

Database Design

This visitor registration application has storage media on the firebase database which is directly related automatically. It is shown in Figure 4.

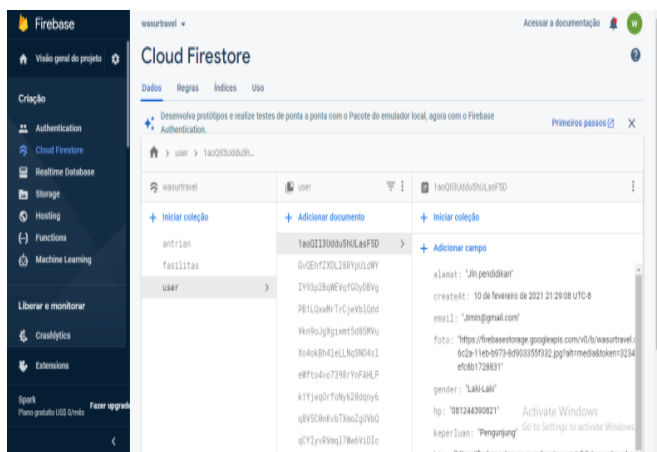


Fig. 4. Display of Firebase Database

System Design

The design of the system in this research is done by making a data flow diagram (*data flow diagram*). In Figure 5 there are 2 entities, namely user and admin. User entities must register on the system by inputting *username*, *password*, *biodata* and *registration data*. Meanwhile, the admin provides

reports through the system in the form of visit information reports and information on changes in visitor data.

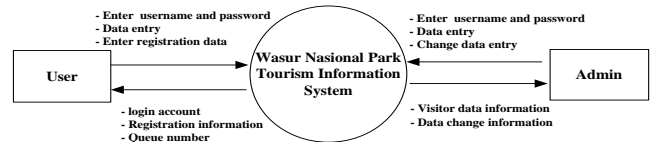


Fig. 5. Diagram Context

After the context diagram, to clarify the flow of information on the system, a *data flow diagram* of level 0 is made.

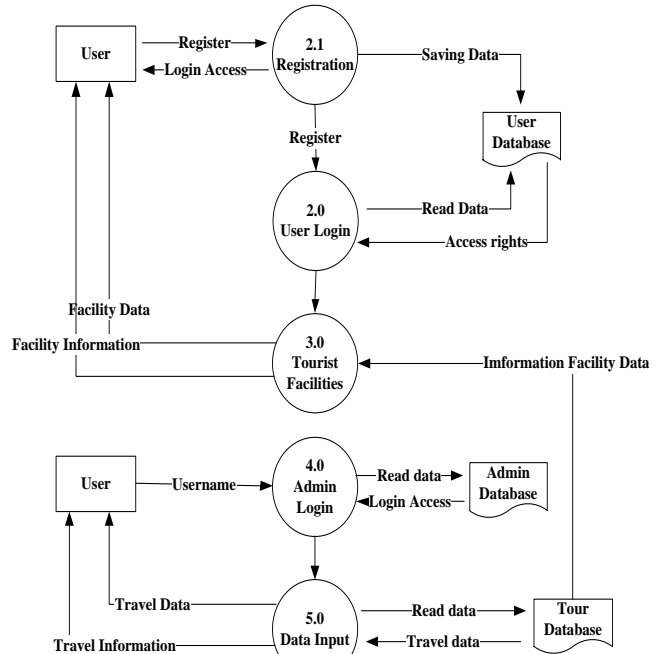


Fig. 6. DFD Level 0

Figure 6 is System of DFD Level 0 which consists 5 sub processes, such as; 1.0 Registration, 2.0 *Login User*, 3.0 *Tourism Facilities*, 4.0 *Login Admin* dan 5.0 *Input of Tourism Data*.

V. RESEARCH RESULT

System Login Page and Main Page

Figure 7 is the login display and the user's main page. Before users use the system facilities, they are required to register first.

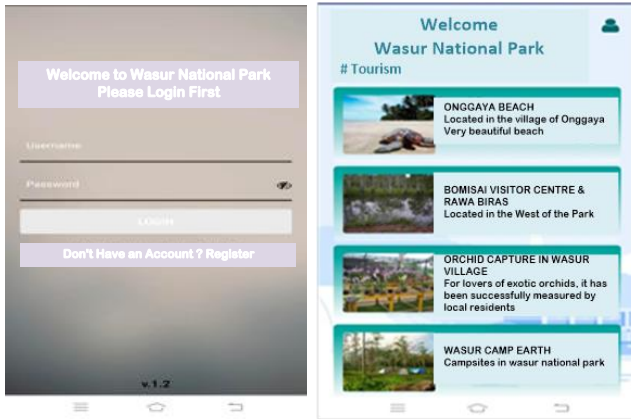


Fig. 7. Display of Login Page and Main Page

The display of Profile User and Admin Main Page

Figure 8 is a display of users who have successfully registered and have logged into the system.



Figure 8. The display of Visitor profile and Admin Main Page

Display of User List and Display of Visitor Report Page

Figure 9 is a list of users who are accessed through the administrator page, on this page you can see reports of tourist visits, reports can be known with daily, weekly and monthly periods.

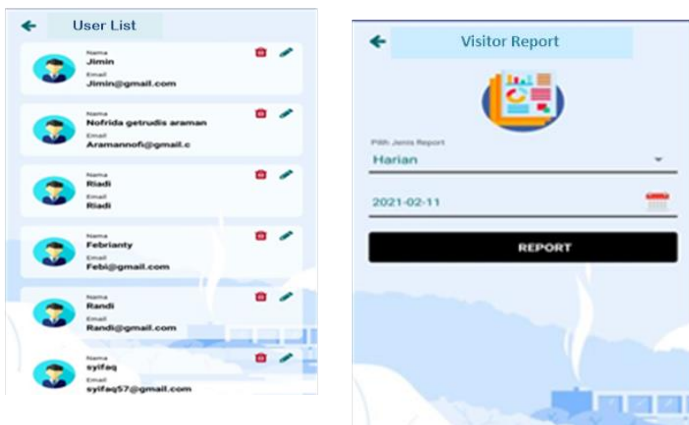


Fig. 9. Display of User List and Display of Visitor Report Page

Likert Scale Graph System Test Result

To evaluate the model, the researcher conducted a usability evaluation using *Technology Acceptance Model (TAM)* proposed by [9] and expanded by [10], using a Likert scale [11].

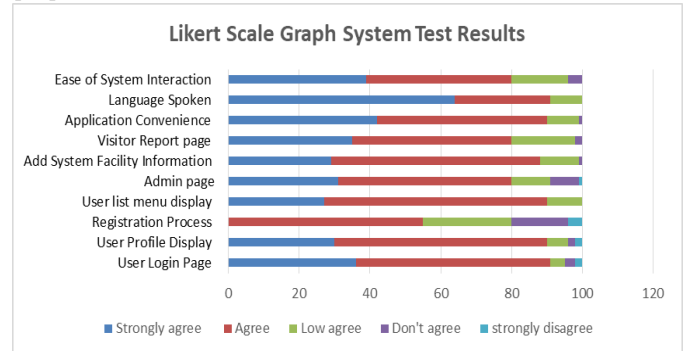


Fig. 10. Graph of System Test Results

Based on the results of the system test graph in Figure 10 using the *Black Box Testing* method of the Android-based Wasur National Park tourism information system, it gets a percentage of 84% that the system is very helpful in making tourist visit reports.

VI. CONCLUSION

After passing through the testing stages by using the *black box* method and measuring user satisfaction with the questionnaire method on the system, the following conclusions were obtained, such as: 1) The system can find out information on visitor data who visited the Wasur National Park area. 2) Based on the questionnaire in terms of users, 84% stated that this system was successful in assisting in making visitor reports as one of the agendas in conducting tourism promotion. Some further research opportunities are that the system in the future can be integrated on the local government *website*, besides that travel information from various regions can be provided so that tourists can prepare a series of excursions in Wasur National Park.

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